Polychlorinated Biphenyl (PCB) Movement and Transformation in Acushnet Estuary Sediments

John F. Brown, Jr. and Robert E. Wagner
General Electric Research and Development Center
Schenectady, New York 12301

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ABSTRACT

The polychlorinated biphenyls (PCBs) in the sediments of the Acushnet River estuary (New Bedford, MA) vary widely in both level and composition. Detailed examination of these PCBs by capillary gas chromatography and mass spectrometry (GC and GC/MS) now shows the following: (a) The original releases consisted of Aroclors 1254 and 1242, probably laid down on the sediments in that order, both rather unevenly. (b) Since the original deposition, these PCBs have undergone partial extraction into the estuarine waters (at a rapidly declining rate), considerable vertical diffusion within the sediments, and partial dechlorination at subsurface levels. However, they have undergone little or no aerobic microbial biodegradation or horizontal transport between sediment sites. (c) The dechlorinating agent(s) present, presumably anaerobic bacteria, apparently became established in the north end of the estuary by the late 1950's and have subsequently spread south about 6 Km (to the hurricane barrier) with at least one minor mutation. (d) The two closely related dechlorination processes (designated H and

H^+) carried out by these agents are distinct from those thus far observed at other PCB spill sites. They are attacking most of the more heavily chlorinated PCB congeners with half-times ranging between about 7 and 50 years, with the pharmacologically active species being among those most rapidly dechlorinated. Thus, the current fate of the PCBs in the Acushnet estuary sediments is dechlorination, detoxication, slow extraction into the tidal waters, and dissipation into the Atlantic.

INTRODUCTION

The commercial PCB products (e.g., Aroclors) that were so widely released into the environment in past decades possessed one unique feature of chemical composition: These products were complex mixtures of chlorinated biphenyl isomers and homologs (generically referred to as "congeners") that were originally present in fixed relative proportions. The chemical complexity arose because there are many different patterns (theoretically, 209) in which 1 to 10 chlorine atoms can become attached to a biphenyl nucleus. The invariance of original composition occurred because a single manufacturing process, iron-catalysed chlorination of biphenyl to a fixed weight gain, was used by all manufacturers during the entire period of PCB production (1).

Because of this chemical peculiarity - complex but fixed composition - the commercial PCBs, unlike other environmental contaminants, can preserve a record of their origin, transformation history, and environmental movement. This happens because the various product grades (classified mainly by weight gain during the original chlorination) each possessed a characteristic distribution of PCB congeners, and because each individual type of transformation process, whether physical, chemical, or biological, attacks the various PCB congeners according to its own selectivity rules, and hence may generate a distinctive new type of congener distribution pattern. Thus, given an environmental PCB sample, a determination of its congener distribution pattern, (e.g., by gas chromatography, or GC) may provide information on the original Aroclor released, the nature of the environmental agents that have altered it, and sometimes also, its route through the environment.

Since the availability of high resolution capillary GC techniques, substantial progress has been made in both the empirical and chemical characterization of the changes effected by individual transformation processes. Thus, the congener selectivity patterns for the oxidative biodegradation of PCBs by 25 strains of aerobic bacteria isolated from PCB spill sites have been reported (3). Most or all of these bacteria are believed to effect biodegradation via dioxygenase attack (4). None of the selectivity patterns observed corresponded to that displayed in warm blooded animals, such as humans (5, 6), where the active enzymes are believed to be monooxygenases of the cytochrome P450 type (7, 8, 9). The changes in Aroclor peak distribution pattern resulting from partial vaporization, extraction into water, or adsorption on soils have also been reported (10). Briefly, all of these phase-transfer processes increase the relative concentrations of individual PCB congaeners in the less condensed phase in approximate proportion to their volatilities (as indicated by elution rates on a GC column) without the structure-dependent selectivities exhibited by the biodegradation processes (3-6).

When the GC patterns of PCBs from heavily contaminated aquatic sediments were examined to see which of the above sorts of alteration patterns might be present, there were observed instead unusual congener distribution patterns, unlike any that had been previously reported (11, 12, 13). Patterns that were seen often enough to be sure of their individuality were given letter designations in approximate order of their discovery (11, 13). Further investigation showed that most of these novel patterns, e.g., Patterns B, B', C, and E of the upper Hudson sediments, and Patterns F and G of Silver Lake (Pittsfield, MA) resulted from the occurrence of reductive dechlorination in the sediments, probably mediated by anaerobic bacteria (11, 13). Since these discoveries we have been endeavoring to collect either sediment samples or gas chromatograms from other PCB spill sites, in order to determine the range and extent of this phenomenon.

In this regard, the sediments of the New Bedford area presented particular interest since they, unlike the others under investigation, had been deposited in salt water, and since there had already been enough survey work around the site (14) to define the geographical distribution of the PCBs (15). Accordingly, we requested copies of some of the original analytical chromatograms and received several from Paul Serabian of the Massachusetts Department of Environmental Quality Engineering, some reprints of published articles showing GC patterns for New Bedford biota and sediments from John Farrington of the Woods Hole Oceanographic Inst. (16, 17, 18) and an extensive collection of chromatograms (19), originally run by Versar, Inc. on samples collected for EPA .

Examination of these chromatograms indicated that at least two PCB-alteration processes had occurred. The first had effected a partial loss of the lower congener peaks (i.e., those arising from dichlorobiphenyls and di-ortho trichlorobiphenyls) in most sediments. but particularly those of the outer harbor. The second had produced a sharp decline in the higher congener peaks (mainly those of penta- and hexachlorobiphenyls), particularly in the inner harbor and upper estuary. The latter alteration suggested possible dechlorination, but the resolution of the analytical GC's did not permit rigorous characterization of either alteration process, and none of the original sediment samples were available. Therefore, we undertook the collection and detailed examination of a new set of samples.

The area selected for study consisted of the upper estuary of the Acushnet River. This is a shallow body of salt water (depth at mean low tide generally 0.2-1.0 m) and surrounding tidal mudflats that is about 2.3 Km long, located between the entrance of the Acushnet (a small stream) at 41°40'37" N and the narrow passage under the Coggeshall St. bridge at 41°39'22" N. This area is thus about 2

Km above (north of) the dock area of New Bedford inner harbor, and about 3.7 Km above the hurricane barrier that forms the boundary between the inner and outer harbors, the latter being alternatively described as either the lower estuary, or an arm of Buzzard's Bay (Figure 1).

Previous sampling studies (14, 15) reported high (>5,000 ppm) PCB levels in parts of the upper estuary, particularly at "shallow" (4-8 cm) depths, albeit in a very "patchy" distribution. The highest PCB levels occurred near the capacitor manufacturing plant located near the northern end of the estuary. This plant is believed (14, 19) to have begun using Aroclor 1254 in substantial quantities in the 1950's, to have switched over most usage to Aroclor 1242 in 1962-65, to have switched again to Aroclor 1016 during 1970-72, and to have used this latter Aroclor until 1978, when all manufacturing use of PCB was banned by law. There is also a report indicating minor usage of Aroclor 1262 in the New Bedford area (14). The 23 different analytical laboratories who have performed PCB analyses on Acushnet estuary air, sediments, water, and biota have reported their findings in terms of Aroclors 1221, 1232, 1016, 1242, 1248, 1254, and 1260 (15).

Thus, it was apparent that our study would have to be concerned with the original Aroclor composition of the PCBs found in the sediment samples, as well as with their transformation.

EXPERIMENTAL

<u>Sample Collection</u> - Samples were collected from the tidal flats near the low tide

line by GHR Analytical Inc. of Lakeville, MA in June, 1986 from 17 sites along the west side of the estuary and six along the east. At each site the surface layers were removed and the two sets of samples taken: Set A at 5-7.5 cm depth and Set B at 15-17.5 cm. At least one sample of each set was retained by GHR for determination of total oil and grease content (reported in Table 3 below) and another was sent to us.

In selecting samples for detailed PCB analysis we first rejected two of the 17 west side samples that appeared to consist mainly of coarse gravel or cultural artifacts. The six of the remaining 15 west side sample pairs that permitted the most even spacing of sample sites, along with all six east side sample pairs, were then analysed.

Analytical Procedures. - The 24 selected sediment samples were air-dried, sieved to remove gravel, extracted in a Soxhlet overnight with 1:1 hexane:acetone, evaporated, and the concentrates extracted with concentrated sulfuric acid, mercury, and florisil. All concentrates were then examined by packed column GC (Hewlett Packard 5880 gas chromatograph; 6'x0.25" glass column packed with 1.5% SP2250 and 1.9% SP2401 on Supelcoport) to monitor the success of the cleanup and determine the appropriate loading for capillary GC. Capillary GC was performed with a Varian 4600 gas chromatograph equipped with an autosampler, splitter/-injector option 1070, a nickel electron capture detector, a Vista 402 data system, and a fused silica capillary column (J&W Scientific, 30m x 0.25 mm I.D., coated with an 0.25u bonded liquid phase of Durabond 1 (DB-1, a cross-linked polydimethylsiloxane). This was operated with an He flow of 30 cm/sec, and a temperature program as follows: 40^{o}C for 2 min; 40^{o} to 80^{o} at 10^{o}/min.; 80^{o} to

225° at 6°/min.; 225° for 10 min. All data obtained was stored on discs so as to permit plotting of the chromatograms on the various scales needed to reveal particular features of interest.

The mass spectra of the effluent from a DB-1 capillary column (30 m x 0.25 mm I.D.; 1 u Durabond 1) were determined by positive ion electron impact using a ZAB VG Analytical organic mass spectrometer. Full mass scans of the mass range 50-500 were completed at 2 second intervals, giving approximately 900 low resolution mass spectra per chromatogram when the column was taken through the temperature range 70°-290°C at 8°/min, or about 1600 mass spectra when taken through the range 150°-290°C at 2°/min. The former GC temperature program was found to permit better detection of weak peaks, the latter greater peak resolution. The mass spectra were used solely to identify the GC peaks of the environmental specimens as indeed arising from PCBs, and to resolve coeluting congeners having different chlorine numbers, since ion fragmentation patterns do not serve to distinguish between PCB isomers (22).

The response factors (weight PCB per unit area of GC peak) for the electron capture detector (ECD) used were generated for all sizeable DB-1 capillary peaks exhibited by Aroclors 1221 through 1262 by the procedure of Webb and McCall (26); that is, by coulometric determination of weight chlorine per unit area of peak (using a Hall electrolytic conductivity detector from Tracor, Inc.) combined with mass spectrometric determination of homolog ratios and hence weight chlorine per weight PCB in the individual peaks. Response factors for the weaker peaks (which could not be reliably measured with the Hall detector) were estimated from published values (21).

PCB Peak Identification - The chromatograms of the Aroclor standards and sediment extracts observed in this and previous studies with our DB-1 capillary system have revealed distinguishable peaks at 118 different relative retention times, which we have designated Peaks 1-118. Of these 22 have been further resolved by mass spectrometry, making a total of 140 chromatographically distinguishable congeners or sets of coeluting isomers.

The prior literature reports PCB congener assignments for the GC peaks given by several Aroclors on columns coated with polydimethylsiloxane (e.g., OV-1, SE-30, SF-96), as determined from relative retention times that were mostly calculated from retention indices (23, 24); and also assignments for Aroclor 1260 peaks on coatings of SE-54 (6), based on measured relative retention times for all 209 congeners on that coating (21). Because of some disparities among the earlier assignments, we determined the positions of 70 individual congeners with respect to the Aroclor GC patterns on DB-1 by spiking Aroclor standards with specimens of the commercially available synthetic congeners and then chromatographing. This showed that within isomer sets (distinguishable by GC-MS) the elution sequences on DB-1 closely paralleled those on SE-54, as might be expected from their chemical similarity (pure polydimethylsiloxane vs. copolymer with 5% diphenylsiloxane). Accordingly, we were able to make assignments for the generally minor DB-1 peaks not adequately identified by our own spiking experiments or the prior literature (23, 24) by use of the observed patterns of relative retention on SE-54 (21). This indicated that 180 congeners had retention times close enough to those of the 118 resolvable GC peaks to require consideration as possible components thereof (Appendix A). In 22 cases, however, the mass spectra permitted resolution of non-isomeric coeluting congeners. In several cases consideration of the relative proportions of the individual chlorophenyl groups in the particular sample being examined indicated that certain of the coeluting isomers would be present at levels too low to merit reporting as significant peak components. Finally, in one case, that of DB-1 Peak 17, the two coeluting congeners, 2,2',3- and 2,4',6-trichlorobiphenyl, were found to be adequately resolved on the packed column GCs, which contained a slightly more polar coating.

In hopes of improved comprehensibility, individual PCB congeners will be designated by a terminology paralleling that commonly used in verbal communication; that is by numbers indicating the substitution pattern on each ring separately, separated by a dash. Thus, 2,2',3,4',5,5',6-heptachlorobiphenyl will be called 2356-245 CB or simply 2356-245.

Calculation of Original Aroclor Ratios and Solubilization Losses. - In order to calculate x, the original ratio of Aroclor 1242 to Aroclor 1242 + 1254, and y, the fractional weight loss attributable to evaporative type processes such as true solution, from raw data on the weight fractions of the various PCB congener peaks in the sediment samples and the Aroclor standards, we used an "indicator peak" procedure. This presumes that we can identify in the sample chromatograms at least two peaks, A and B, which, after correction if appropriate, can be considered to be unaffected by the chemical transformation(s) underway. If we define the following parameters:

a fraction Peak A in sample

a_1 fraction Peak A in Aroclor 1242 standard

a_2 fraction Peak A in Aroclor 1254 standard

b fraction Peak B in sample

b_1 fraction Peak B in Aroclor 1242 standard

b_2 fraction Peak B in Aroclor 1254 standard

c_1 relative effect of evaporative loss on A, i.e., $\Delta a/a\Delta y$

c_2 relative effect of evaporative loss on B, i.e., $\Delta b/b\Delta y$

c relative effect of evaporative loss on A/B ratio

then simple material balances indicate that:

(1) $a = [(1-c_1y)/(1-y)][a_1x+a_2(1-x)]$

(2) $b = [(1-c_2y)/(1-y)][b_1x+b_2(1-x)]$

(3) $$\frac{a}{b} = \frac{(1-cy)[(a_1-a_2)x+a_2]}{[(b_1-b_2)x+b_2]}$$

Examination of the chromatograms (described below) indicated that congeners 26-34 and 236-34 were probably not being significantly formed or destroyed by the transformation processes at work in the sediments examined, and hence that Peaks 39 (originally mainly 26-34 CB, with a little 236-4 and 234-2) and 61 (originally mainly 236-34 CB, with a trace of 34-34) could be used as indicators for Aroclors 1242 and 1254 respectively. The only correction applied was that the 234-2 in Peak 39 was presumed to be originally present at the 10% level, but to then decline in proportion to any observed decline in Peak 50 (23-34 plus a little 234-4). For these peaks we were able to evaluate the constants in equations 1-3 from

Aroclor 1242 and 1254 standards, and from a sample of Aroclor 1242 that had been evaporated to 34% weight loss in the laboratory as follows: a_1, 0.03160; a_2, 0.00789; b_1, 0.00743; b_2, 0.0895; c_1, 0.43; c_2, 0.1; c, 0.382.

Using these values, equations 1-3 were solved for x and y by a process of successive approximations. Examination of the sensitivity of the solutions to variations in the observed parameters a and b indicated no particular magnification of errors in the case of the x values (mainly because the intensity ratios a_1/a_2 and b_2/b_1 are quite large for both peaks). For the y values, however, where $1/(1-y)$ is roughly proportional to (a+b), errors in a or b could be magnified. As a check for such errors, we roughly estimated y from the loss in the very strong pair of Aroclor 1242 peaks, Nos. 23 and 24, given by 25-4 and 24-4 CB, and made note of the cases where the calculation via eq. 1-3 had given a questionable result.

RESULTS

Aroclor and Alteration Pattern Identification. - The raw data collected during this investigation consisted of SP2250/SP2401 (packed column) and DB-1 (capillary) gas chromatograms, and peak quantitations by weight and mole fractions on the 118 resolvable DB-1 peaks for each of the 24 sediment samples and the Aroclor standards. It also included GC-MS ion chromatograms measured with two different temperature programs (to optimize either sensitivity or resolution) for the standards and for representative samples. All of the DB-1 chromatograms and data print-outs, along with keys to the peak number assignments and congener identifications, are attached as Appendix A.

Visual inspection of the DB-1 chromatograms revealed a variety of patterns. Some GC patterns (e.g., 9A) resembled that of Aroclor 1242; some (e.g., 18A) were quite similar to Aroclor 1254; most, however, resembled Aroclor 1242-1254 mixtures that had been subjected to either or both of two types of pattern alteration.

The first of these types of alteration consisted of a general, non-selective loss of peaks with short retention times, very similar to that seen when Aroclor 1242 samples were simply allowed to evaporate in the laboratory (Fig. 2 below). There was no hint of the patterns of selective PCB congener removal (i.e., rapid loss of 2-3 and 2-4 CB; slower of 25-2 and 24-2; very slow for 26-2, 26-3, and 26-4 CB) that have been repeatedly observed for aerobic microbial biodegradation by either pure cultures (3,4) or sewage sludge (10). This observation is consistent with those we have made at other sites, where PCB pattern alterations resembling those effected by aerobic microbial degradation were often seen in river water, ground water, and soil samples, but only rarely in aquatic sediments.

The second type of alteration consisted of parallel declines in the major peaks 25, 26, 46, 47, 48, 50, 53, 58, 59, 63, 69, 74, 82, 89, 95, 102, and 106, and in many weaker ones as well, along with the increases in peaks 7, 12, 13, 21, 22, 31, 32, 33, 40, 43, 44, 49, 54, 55, 62, and 88. This pattern of alteration was thus somewhat intermediate between, but clearly distinct from, those previously designated as Pattern B (11, 13) and Pattern F (13), which were seen in many sediment samples of the upper Hudson River (NY) and Silver Lake (Pittsfield, MA), respectively. Accordingly we concluded that it represented a new type of alteration, and designated it Pattern H. Subsequent reexamination of the chromatograms revealed an occasional slightly different pattern, characterized by greater relative declines in Peaks 26, 27, 37, 38, and 45 than with Pattern H; this was designated Pattern H'. Figure 2 shows representative examples of well-developed Patterns H and H' (from sediments 19B and 12B, respectively), along with reference chromatograms of Aroclors 1016, 1242, 1254, and 1242 after 34% evaporative weight loss.

Attention was then given to the possibilities that the original PCB discharge may have contained Aroclors 1016, 1248, or 1262 rather than just 1242 and 1254.

Fig. 2 shows that in Aroclor 1242 there is a prominent Peak 50 (mainly 23-34 CB) that is much weaker in Aroclor 1254 and only 1.5% as strong in Aroclor 1016. Thus, in undechlorinated 1242 specimens (such as those of the outer harbor) loss of Peak 50 (relative to indicator Peak 39) can provide a sensitive measure of admixed Aroclor 1016. To extend this method to lightly dechlorinated samples, we found that in the deeper, and hence presumably older (pre-1016), sediments undergoing dechlorination by System H, the disappearance rates for the trichlorobiphenyl component of Peak 25 (mainly 34-2 CB) and for Peak 50 were about equal. Accordingly, we could subtract any percentage loss in Peak 25 trichlorobiphenyls from that in Peak 50, to get an approximate measure of the portion of the Peak 50

In the case of Aroclor 1248, which gives a chromatogram virtually identical to that of 1242 after ca. 50% evaporation, chromatographic proof of presence or absence in admixture with extractively devolatilized Aroclor 1242 would be very difficult. However, the site contamination history (14, 19) indicates no known releases of Aroclor 1248, which was never used in electrical devices (1). Accordingly, we conclude that the "Aroclor 1248" reportings by previous analysts (15) all represent devolatilized Aroclor 1242 rather than actual 1248.

Regarding Aroclor 1262, careful inspection of the sediment chromatograms showed that the major octachlorobiphenyl peaks (Peaks 109, 110, 112, and 115) were always slightly stronger than in our Aroclor 1254 standard, i.e., with a total weight percent (of Aroclor 1254 content) about 0.3% rather than 0.15%. The excess octachlorobiphenyls were accompanied by only modest proportions of nonachlorobiphenyls (Peaks 113, 114, and 117) indicating the additional Aroclors, if any, to be Aroclor 1260 or 1262 rather than 1268. Since Aroclor 1262 contains 14% by weight of the measured octachlorobiphenyls, the observed increase in octachlorobiphenyls could have been produced by 1% contamination of the 1254 with 1262. Alternatively, it may simply be that the average Aroclor 1254 produced during the period of discharge contained 0.15% more octachlorobiphenyl than did our analytical reference standard.

<u>Characterization of Alteration Processes H and H'</u>. - The alterations in PCB congener distribution effected by Process H are probably most easily seen in the GC-MS ion chromatograms run under conditions that maximized resolution, even though such tracings lacked a few of the weaker peaks, including those of the

mono- and octachlorobiphenyls, which were present only at very low levels. Fig. 3 shows the di- through heptachlorobiphenyl ion chromatograms for sample 19A, for which the quantitatively more reliable capillary GC is shown in Fig. 2.

Beginning with the dichlorobiphenyl panels of Fig. 3, it is evident that there has occurred in the sediments a marked increase in Peaks 7, 12, and 13 (2-3, 3-3, and 3-4 CB) relative to the originally prominent Peaks 5, 8, and 14 (2-2, 2-4, and 4-4 CB). There is also a possibility that the latter peaks may all be increased slightly relative to Peak 6 (24- and 25-CB), which is probably the least likely of the group to be either increased or decreased by dechlorination.

The trichlorobiphenyl tracings of Fig. 3 and Fig. 2 show little or no change in the relative levels of Peaks 10, 14, 15, 16, 23, 24, and the component of Peak 17 that elutes earlier on the packed column GC; the congeners responsible for these peaks are 26-2, 25-2, 24-2, 26-3, 25-4, 24-4, and 26-4, respectively. Very prominent increases are shown for the peaks for 25-3 and 24-3 CB, and small increases for 35-2, 34-3, and possibly 35-3 (Peak 27). Marked decreases were seen for Peaks 25, 26, and 38, given mainly by 34-2, 23-4, and 34-4 CB, respectively.

Among the tetrachlorobiphenyls, the unaffected congeners appeared to be 26-25, 26-24, 236-2, and 236-34. Large increases were seen in 25-25, 25-24, and 24-24, with lesser absolute, though still proportionately important, increases in 24-35, 235-3, and 245-3. The peaks exhibiting 50% decline include those for 245-2, 23-23, 245-4, 25-34, 24-34, 234-3, 23-34 (+234-4), and 34-34. Congeners 23-25 and 23-24 CB showed sizeable losses in sediments derived primarily from Aroclor 1242, small losses in most of those with higher Aroclor 1254 content, and an actual gain at one such site (samples 21A, 21B).

Among the pentachlorobiphenyls, there appeared to be little or no net change in the peaks for 236-26, 236-25, 236-23 + 235-25, 235-23, and 235-34 CB, although there may have been a slight increase in 236-25. Unequivocal increases occurred in 246-25, 246-24, 236-24, 245-24, and in Peak 55 (246-34 + 2356-3). All of the other pentachlorobiphenyls declined, with the largest losses being in 245-25, 234-25, 234-24, 234-23, 245-34, and 234-34 CB.

With the hexachlorobiphenyls, there appeared to be little change in 236-236, 235-236, 245-236, 2356-23, or 235-245. The only clear gains were in the minor components 245-246 and 2356-24. All of the other hexachlorobiphenyl peaks declined, with the largest absolute losses being in 234-236, 245-245, 2345-25, 234-245, 234-234, and 2345-34.

Among the heptachlorobiphenyls, there was probably no change in Peak 78 (2356-236 CB); but a clear 30-40% increase in Peak 88 (2345-246 + 2356-245), and clear decreases in all the other congeners. The octachlorobiphenyls were not reliably detected by GC-MS, but were on amplified versions of the DB-1 capillary chromatograms. Because of the uncertainties regarding the octachlorobiphenyl levels in the original discharges, it was not possible to establish their alterability by System H; however, the clear increase in heptachlorobiphenyl Peak 88 suggests that some dechlorination of octachlorobiphenyls had occurred.

Figures 2 and 3 thus show that alteration Pattern H arises from marked decreases in the levels of most of the higher (more heavily chlorinated) PCB congeners, and corresponding increases in some of the lower congeners, as was seen also for the previously discovered PCB dechlorination systems (11, 13). In order to identify the simplest set of dechlorination process steps that would account for this pattern of change we sorted out the congeners responsible for the observed changes according to the types of individual chlorophenyl (CP) groups present (Table 1). We thus identified as not dechlorinatable by System H groups 2-, 3-, 4-, 2,4-, 2,5-, 2,6-, 3,5-, 2,3,6-, 2,4,6-, and 2,3,5,6-CP on the grounds that there was no clear evidence of decline in any PCB congeners containing only these CP groups. The remaining types of CP groups, namely, 2,3-, 3,4-, 2,3,4-, 2,3,5-, 2,4,5-, 3,4,5-, 2,3,4,5-, 2,3,4,6-, and 2,3,4,5,6-CP, were all identified as potentially reactive to System H on the grounds that one or more PCB congeners containing these CP groups attached to one of the unreactive CP's did show a decline. We did observe, however, that when 2,3-, 3,4-, 2,3,5-, and possibly 2,4,5-CP groups were attached to a CP having two ortho chlorines, as in 2,6-, 2,3,6-, 2,4,6-, or 2,3,5,6-CP, there was no longer any reactivity. This phenomenon is reminiscent of the reactivity pattern exhibited by upper Hudson dechlorination Systems B, B', C, and E, where congeners 236-34 and 2356-34 CB showed reduced reactivities (11, 13), although not as markedly so as towards System H. The effect was not universal, however. PCB congeners containing 2,3,4- or 2,3,4,5-CP groups attached to unreactive di-ortho substituted CP's were still attacked by the System H.

The mass balance analyses that were useful in establishing that the compositional changes seen in the upper Hudson (11) and Waukegan Harbor (25) sediments proceeded solely by loss of chlorine atoms located meta or para (rather than ortho) to the other ring could not be strictly applied because of the elutriative losses; however, there was no obvious indication of reduced ortho chlorine content in the dechlorinated products, nor any evidence of the marked decline in tri-and tetra-ortho CB's that was exhibited by the ortho-reactive System F (13). Accordingly, it was tentatively concluded that System H, like the upper Hudson and Waukegan Harbor Systems is a meta/para-selective dechlorination system. This conclusion, plus consideration of the relative mole fractions of CP groups lost and gained, permitted identification of the source of the small gain in PCB congeners containing 2-CP groups as 2,3-CP group dechlorination; of the large gain in congeners containing 3-CP's as 3,4-CP loss; of the occasionally increased 2,3-CP as 2,3,4- (also conceivably 2,3,5-) loss; of the sizeable 2,4-CP gain as 2,3,4- (plus conceivably 2,4,5-) loss; of the large 2,5-CP gain as 2,4,5- (plus the smaller 2,3,5-) loss; of the occasionally increased 2,3,5-CP as 2,3,4,5-CP loss; and of the small but unequivocal gains in congeners containing 3,5-or 2,4,6-CP groups as 3,4,5- or 2,3,4,6-CP dechlorinations, respectively. The extent to which this set of conclusions is supported by the various observations of PCB congener level change is set forth in Table I. This Table shows that a simple stepwise matching between congener loss and congener gain is frequently precluded by the fact that the congener that is the product of one dechlorination step may still be the substrate for another; however, there are still enough unequivocal observations to define a self-consistent pattern.

In order to estimate relative dechlorination rates for the various chlorophenyl groups, we first determined the numbers of half-losses (calculated as $-\log_2$ of the fraction of the original congener level still present) for various penta-, hexa-, and heptachlorobiphenyls (which are primarily derived from Aroclor 1254) in sediments showing well-advanced Aroclor 1254 dechlorination. We then did the same for the reactive tri- and tetrachlorobiphenyls (which are primarily derived from Aroclor 1242) in sediments where Aroclor 1242 dechlorination was prominent. We then presumed, on the basis of the mean values shown in Table 3 below, that in sediments where the dechlorinations of Aroclor 1254 and 1242 were equally advanced the reductions in Peaks 50 (mainly 23-34 CB) and 58 (234-25 CB) would be about equal. This permitted the estimates of the relative reactivities for all of the major PCB congeners shown in Table 2.

This Table shows that PCB congener reactivity towards dechlorination System H is determined not only by the arrangement of chlorine atoms on the presumably reactive CP group, but also by their arrangement on the other, presumably unreactive, CP group, where ortho (2 and/or 6) substituents appear particularly important in reducing reactivity. Table 2 also shows that the minor dechlorination system, H', differs from H in exhibiting higher reactivities for 2,3-, 2,3,5-, and 2,3,6-CP groups, relative to the rest of the pattern. The conversion of these observed relative reactivities to absolute rates, (i.e., dechlorination half-times) will be addressed in the Discussion.

Compositional Variations in Upper Estuary Sediments. - The resistance to dechlorination of 26-34 and 236-34 CB, congeners which give rise to prominent peaks in Aroclors 1242 and 1254, respectively, meant that these peaks could be used to estimate the original Aroclor 1242-1254 ratios by the "indicator peak" method described in the experimental section. Likewise, the identification of Peaks 50 and 58 (prominent in Aroclors 1242 and 1254, respectively) as containing only easily dechlorinated congeners (i.e., 23-34 plus a little 234-4 CB and 234-25 CB, respectively) meant that the declines in these peaks could be used as indicators of the dechlorination states of the two Aroclors. The resulting compositional data are presented, along with information on site locations and total levels for oils and PCBs, in Table 3. This table lists the site numbers for samples taken along either the west or east side of the estuary in either the first or second column, respectively, and in the same order as the north-to-south sequence of sites; thus the arrangement of the site numbers within the first two columns also constitutes a rough map of the relative positions of the sites.

From Table 3, the following findings were noted. First, the usual range of estuarine bottom textures (mud, sand, gravel, and marsh bed in various proportions) was represented. No measurements of oxygen levels were made, but it was noted that the sediments after drying generally graded in color from the black of FeS to the brown of Fe_2O_3 upon moving from north to south over the range studied. The odor of H_2S was apparent in the samples denoted "soft black mud," indicating that they, at least, were anoxic. Unfortunately, however, there were no obvious correlations between either PCB level or alteration state and sediment textures.

The large excess of hydrocarbon oils (some of which do give weak responses on the electron capture detector used for the GC analyses) and other minor contaminants meant that the measurements of relative PCB peak heights were unreliable for samples containing only low levels of PCBs; accordingly the compositional indices calculated for such samples, if reported at all, are flagged with an approximation sign.

Third, there was a general tendency for the A and B (shallow and deep) specimens at each site to be similar in color, texture, and odor; in levels of both oils and PCBs; in the calculated 1242:1254 ratios, extractive losses, and dechlorination indices; in the dechlorination pattern; and also in the patterns of minor, non-PCB peaks on the chromatogram. These similarities occurred despite much wider variations between sites in all of these parameters, and hence suggest that both the oils and the Aroclors had been undergoing vertical diffusion within the sediments at most sites.

The Metcalf & Eddy (15) summary of previous sampling data also noted wide site-to-site variations in PCB level in the upper estuary. In addition, however, this compilation suggested that PCB levels there were highest at "shallow" (4-8 cm) depths, corresponding to our depth "A", somewhat lower at the "surface" (0-4 cm), and one to two orders of magnitude lower in the "deep" (>8 cm) layers, which would correspond to our depth "B". This latter generalization is in clear discord with the data shown in Table 3. For all sites examined, the average total PCB levels at depths A and B were 1187 and 839 ppm, respectively, indicating a mean B-depth (15-17.5 cm) PCB level only 29% lower than at depth "A" (5-7.5 cm).

Fifth, there was a general tendency for the total PCB levels, and particularly that of the Aroclor 1254 components, to decline from north to south, in accord with the previous report (15), indicating an upstream source for the Aroclors.

Sixth, despite the diffusive blurring of the stratification, it was still possible to see three compositional differences between the PCBs at depths A and B: (a) at every site where the PCB levels were high enough for reliable peak area measurements, the Aroclor 1242:1254 ratio was similar to or larger in the upper

("A") sample than in sample B, suggesting that the Aroclor 1242 deposition came generally later than that of Aroclor 1254. (b) Again at every site with PCB peaks strong enough for reliable comparison, the extent of dechlorination, whether of the Aroclor 1242-derived Peak 50 (23-34 CB), or of the 1254-derived Peak 58 (234-25 CB) was equal to or greater in the "B" (lower) sample than in "A", indicating that the dechlorination was occurring preferentially in the lower layers, as in the upper Hudson sediments (11). (c) At both "A" and "B" depths, the dechlorination was more advanced in the Aroclor 1254-derived peak in the more northerly (upriver) sites, and more advanced in the Aroclor 1242-derived peak in the more southerly sites, indicating that seeding with the dechlorinating agent occurred before the time of Aroclor 1242 deposition at the former sites, and after that time in the latter.

PCB Compositional Changes in Other New Bedford Area Specimens. - Prior to collecting the upper estuary samples for DB-1 capillary GC analysis, a careful study of the Versar (19) and Woods Hole (16-18) chromatograms was made to identify features indicative of compositional change.

The sediment samples analysed by Versar included 72 grab samples collected by GCA/Technology Division for EPA throughout the New Bedford area and surrounding waterways in August 1982 and 72 upper estuary core sections similarly collected in January 1983, as well as sediments taken from sewage lines and sewer overflow areas. The analyses were done by conventional packed column GC on a polydimethylsiloxane column. We observed the chromatograms of the Aroclor standards, which accompanied those of the sediments, to be very similar in general appearance to those reported by Webb and McCall (26). Accordingly, we used the Webb and McCall peak designations (which describe retention times relative to DDE=100 for peaks obtained on an isothermal (195°C) SE-30 packed column) for denoting the Versar GC peaks seen. Such packed column peaks rarely represent individual PCB congeners; instead they correspond to unresolved aggregates of the peaks seen on polydimethylsiloxane-coated capillary columns, such as DB-1. The correspondence between the packed column and DB-1 peak numbers is given in Figure 4 (Appendix A).

The Versar chromatograms of the various sediments showed all of the low resolution peaks seen in the Aroclor 1242 and 1254 standards, but with often sizeable differences in relative peak heights, and occasionally slight differences in the apparent relative retention time (RRT). In virtually all cases the peaks with RRT 21, 28, 32, and 40 were clearly depressed relative to the very strong peak at RRT 37 (which corresponds to Peaks 21-24 on Fig. 1). In the tetrachlorobiphenyl region there was usually enhancement of the peak at RRT 47, and depression of those at RRT 54 and 78. In the penta- to hexachlorobiphenyl region, some GC patterns showed the peaks at RRT 84, 125, 146, and 174 at the same relative peak heights as in the Aroclor standards, whereas others showed a marked "high end drop-off," meaning that the observed pattern of relative peak height became 84 > 125 > 146 > 174. (The pentachlorobiphenyl peaks at RRT 96 and 104 were not observable on the Versar GC's because DDE, RRT=100, had been added to all samples as an internal standard). This was a sufficiently unambiguous feature of the packed column chromatograms to permit the GC's of sediments that contained >1 ppm PCB to be scored for "high and drop-off." This scoring was done before we had the key indicating the relationship between the separate sets of identification numbers used by the sampler and the analyst.

When the key became available, a striking geographic correlation emerged: all of the samples collected in the estuary north of the hurricane barrier showed the "high end drop-off" feature in their chromatograms, whereas this feature was not detectable in the samples from any of the other marine collection sites: e.g., those in the lower estuary, south of the hurricane barrier, those in Clark's Cove, or in the surrounding areas of Buzzard's Bay. The only other sediment chromatograms exhibiting the "high end drop-off" feature were those of a small group of otherwise 1254-like specimens that were collected in a short section of the East Rodney French Blvd. (ERFB) sewer line near David St. The effluent from this line ultimately discharges into the outer harbor.

Correlation of the packed column and capillary chromatograms showed that the packed column peaks at RRT 84, 125, 146, and 174 must be produced mainly by the congeners responsible for DB-1 Peaks 51-54, 69, 74-75, and 82 respectively, indicating that a sample that had undergone dechlorination by System H or H' would indeed exhibit the observed "high end drop-off" in the packed column GC. However, because of the lower resolution of the packed column chromatograms we cannot exclude the possibility that the dechlorination system operating in the middle estuary (e.g., inner harbor) or in the ERFB sewer line may have been of a subtype different from H or H'.

Brownawell and Farrington (18) have published SE-30 capillary gas chromatograms for two sections (3-5 and 35-45 cm) taken from a single outer harbor core collected in September, 1983. Reference to the Figure 1 standards indicated that these two PCB samples resembled a simple mixture of Aroclor 1254 with evaporated 1242 and virtually pure Aroclor 1254, respectively. The accompanying plots (18) of peak height data for intermediate core sections showed a nearly smooth decline with depth for the Aroclor 1242:1254 ratio. Our measurements on the published chromatograms indicated that for the upper sediment sample the peak corresponding to DB-1 peak 50 had a height of 103±5% of that in the Aroclor 1242 standard, both measured relative to peak 39, indicating that no detectable Aroclor 1242 dechlorination or admixture with Aroclor 1016 had occurred. However, the Peak 58 heights were depressed 37% and 8% relative to the Aroclor 1254 standard in the upper and lower sediments respectively, indicating some deposition of dechlorinated 1254 (possibly from the ERFB sewer line) in the upper sample. The 3-5 cm sediment GC also showed small losses in congeners 105 and 138, corresponding to DB-1 peaks 74 and 82 (234-34 and 234-245 CB), and a small gain in peak 54 (245-24 CB), consistent with, but not unambiguously demonstrative of, Pattern H. None of these small changes would have been large enough to produce an observable "high end drop-off" in the packed column GC.

Water samples collected from just south of the hurricane barrier in September, 1982, were reported to contain approximately half their PCBs in true solution and half as suspended particulates (16). This report shows a pair of DB-5 capillary gas chromatograms for dissolved and suspended PCB fractions of a water sample collected at ebb tide. We noted that the GC of the dissolved fraction resembled that of a partially dechlorinated Aroclor 1242 with marked enhancement of dichlorobiphenyl peaks 5 and 7 and/or 8, (2-2 and 2-3 and/or 2-4 CB, while that of the suspended particulates looked more like the sort of lightly dechlorinated

1242-rich Aroclor 1242-1254 mixture seen in some of our least altered "A" level sediments from the upper estuary (e.g., 2A) except for the absence of all dichlorobiphenyl peaks. Relative peak height measurements indicated the losses in the Aroclor 1242-derived Peak 50 to be 44 and 20%, and those in the Aroclor 1254-derived Peak 58 to be 42 and 41% in the dissolved and suspended fractions, respectively. The losses for both these peaks averaged 67% (1.6 half-clearance) in the upper estuary sediments (Table 3). Thus, the levels of Aroclor 1242 and 1254 dechlorination in the water at the north end of the outer harbor at ebb tide were intermediate between those of the upper estuary sediments and those of the outer harbor.

The Woods Hole group also reported chromatograms of mussels (Mytilus edulis), green crab (Neopanope taxons) and lobster (Homarus americanus) from about the same location (17). The mussel PCBs resembled an Aroclor 1242 + 1254 mixture, but with those peaks that are most sensitive to System H dechlorination (e.g., DB-1 peaks 25, 26, 50, 58, 59, and 74, corresponding to 34-2, 23-4, 23-34, 234-25, 234-24, 234-23, and 234-34 CB) largely removed. These same peaks were also largely removed from the chromatograms of the lobster and crab, along with those of all PCB congeners lacking in 4,4'-substitution. Thus, the GC pattern of the residual PCBs in the lobster showed strong peaks for 245-34, 245-245, and 245-234, and medium ones for 24-4, 24-24, 245-4, 24-34, and 245-24 CB. In the crab, there was much additional loss of congeners other than 245-245 CB; 245-34 was down by a half, and 245-4, 24-34, 245-24, and 245-234 still more so. These PCB congener-persistence patterns are quite similar to those seen in the human (5,6) and indicate that the two crustaceans, unlike the mussel, possess active eukaryotic

P450 cytochrome systems (7,8) for metabolizing lipophilic xenobiotics. The chromatograms of flounders (Lephopsetta maculata and Pseudopleuronectes americanus) from the same area were not published, but were stated to be intermediate in appearance between those of the mussels and lobsters (17), implying the presence of a P450 cytochrome system, but at lower levels. Because of the biodegradative activities thus exhibited by the crabs, lobsters, and flounder, we cannot be certain whether the sharply reduced levels of System H-sensitive congeners, such as 23-34, 234-25, 234-24, 234-23, and 234-34, that were seen in their tissues resulted from reductive dechlorination in the sediments or oxidative metabolism in the animal; however, their reduced levels in the mussels are clearly relatable to dechlorination.

DISCUSSION

This investigation resulted in the accumulation of a body of very detailed compositional information (in the form of quantitated capillary gas chromatograms) on the PCBs in upper Acushnet estuary sediments, and also provided more limited compositional information on those of other sediment, biota, and water samples from the New Bedford area. The PCB congener distributions observed in individual samples permitted deductions as to the original Aroclor compositions of the PCB releases, and the transformation processes that subsequently occurred. Comparison between the Aroclor compositions and transformation states of the PCBs in different samples permit deductions as to PCB diffusion and translocation, and the timing of the observed dechlorination processes. In this section we shall discuss these findings and deductions, and examine their implications as to the future progress of natural decontamination and detoxication processes in the Acushnet.

Vertical Movement of Estuarine Sediment PCBs. - Previous investigations of PCBs in freshwater sediments, e.g., those of Lake Superior (27), Lake Michigan (28), and the Upper Hudson (11) have shown good preservation of stratification, indicating very little vertical mobility for the PCBs. In sharp contrast, our 12 pairs of samples showed no large compositional differences between the 5-7.5 cm and 15-17.5 cm levels for any of the 7 parameters listed in Table 3, strongly suggesting diffusive blurring of stratification. Also suggestive of vertical diffusion are the various reports (15, 16, 18) indicating PCB levels in the sediment surface layers to be equal or nearly equal to those in the subsurface, despite the cessation of significant PCB releases (14), the continuation of active sedimentation (29), and losses of PCBs to the water column (16).

There are two possible mechanisms by which vertical diffusion might occur. First, Brownawell and Farrington (18) have shown that the pore water in these sediments contains detergent-like agents that solubilize the PCBs. This would permit the movement of the otherwise highly water-insoluble PCBs from particle to particle in the sediments. Alternatively, it could be that bioturbation processes are much more important in the tidal flats of the Acushnet estuary than in freshwater sediments. Whatever the cause, this vertical diffusivity of the PCBs has some significant consequences. One is that observations of substantial levels of PCBs even below 40 cm at some sites (15, 18) may not mean that that much sedimentation has actually occurred over the past 20-30 years. Another is that whether or not further sedimentation does occur, all of the PCBs now in the sediments may be able to reach those anaerobic layers where dechlorination is proceeding. A third is that they may also be able to reach the surface, and then elute out into the water.

Elution of PCBs from Sediments into Water. - There are two well established mechanisms by which PCBs could be transferred into the aqueous phase. One is by true, evaporative-type, molecular solution in the water. Evidence for the occurrence of this process in the Acushnet is presented by the non-selective loss of the more volatile and water-soluble congeners from the PCBs now in the sediments (Figure 1), and the corresponding enrichment of these congeners in the PCBs found in filtered water (16). Since this process results in a compositional change we could calculate its extent (Table 3). For the upper estuary subsurface PCBs as a whole, the average loss due to this mechanism of solubilization was 18% (Table 3). The second possible mechanism of transfer to the water column consists of facilitated solubilization by either organic solubilizing agents or suspended particles. This type of process does not result in significant change in PCB composition (18). Brownawell and Farrington's analyses of the state of the PCBs in the estuarine waters indicated both of these processes to be of about the same importance (16), whereas the Batelle data (43), as averaged by ASA (44), indicated a ratio of 1:1.61. These two ratios indicate the total losses of PCBs from the sediments to the water column to be 31% and 36%, respectively.

In order to estimate the absolute magnitude of this loss, we assumed (a) the near equivalency of PCB concentration values expressed as g/g (dry weight) to those expressed as g/cm^3 (wet sediments) on the basis of the reported (16) water content of outer harbor sediments; (b) that the mean level of PCB in the top 20 cm. of the sediments of the northern half of the upper estuary was 1000 ppm (Table 3; also consistent with ref. 15); (c) that the corresponding level in the southern half was 100 ppm (15); and that the total area of the sediments in the upper estuary was about $9\times10^5 m^2$ (from ref. 44). Multiplication then indicated the total current weight of PCB in the upper 20 cm. of the upper estuary sediments to be about 10^5 Kg., showing the total losses to the water column to have been about 50,000 Kg.

ASA (44) has estimated the current flux of PCBs from the sediments to the water by a two-dimensional vertically averaged finite element pollutant transport model as 189 Kg/yr. Three calculations using a simple one-dimensional model gave fluxes averaging 99 Kg/yr. Even the larger, and presumably more reliable, value represents a current annual flux of only 1/265 the total estimated losses. The inescapable conclusion is that during and shortly after the period of active discharges the rate of PCB extraction into the water column must have been between 10- and 100-fold greater than at present, and that the elution rate has been dropping sharply since that time.

Horizontal Movement of Estuarine Sediment PCBs. - There are two obvious mechanisms by which PCBs might move from one patch of sediment to another. One would be by scouring and redeposition of sediment particles carrying bound PCBs. The other would be dissolution into and readsorption from the water column. A priori, both mechanisms would appear eminently plausible: there is an abundance of heavily contaminated sediments present (14, 15), and there must have been very substantial levels in the estuarine waters in the recent past. The available evidence. however, indicates that neither translocation process has been occurring to a significant extent in the Acushnet. This evidence is of two types. First, both we (Table 3) and others (15) have observed an extraordinarily spotty distribution of both Aroclor 1242 and 1254 in the upper estuary sediments, with many instances of 1000-fold concentration differences between nearby sites. Second, there are virtually none of the dechlorinated PCBs, which are ubiquitous in the sediments located north of the hurricane barrier, in those located south of it. Neither observation would be possible if there had been any significant horizontal transport between sediment banks, by whatever mechanism.

This current immobility of the PCBs now present in Acushnet estuary sediments raises the question of how the PCBs could have become so broadly distributed over the estuary in the first place.

We suggest that the PCBs, which are heavy, water-insoluble oils (1) were originally released to the estuary in the form of suspended droplets, and that these droplets moved various distances before sinking into the sediments. This would result in a rather spotty deposition on the sediments. the deposition pattern for each release being determined by the location of the discharge point and the state of the tide. Once adsorbed onto the sediment particles, however, little further horizontal movement between sediment sites could occur except by scouring and redeposition, which require higher water flow rates than normally occur in the estuary (44).

Where horizontal movement is occurring, of course, is in those PCBs that have become dissolved or suspended in the tidal waters. It would appear from the considerations outlined in the previous section that about 35% of the PCBs originally released into the upper estuary have already traveled this route through the waters of the lower estuary and Buzzard's Bay to the Atlantic, where their ultimate fate will be photolysis by sunlight (30) and oxidative biodegradation by various aerobic life forms (3, 4, 7). However, the Versar (19) and Brownawell (18) chromatograms both indicate that these partially dechlorinated PCBs are not being readsorbed from the water column by outer harbor sediments.

The inability of PCBs to move from one sediment bank to another, by whatever mechanism, along with the observed differences in composition, means that there must have been separate sources for the PCBs found in the sediments of the upper estuary, Clarks Cove, and the outer harbor. However, the composition of the PCBs in the water of the latter site indicates that they must have been derived partly from the sediments of the upper and middle estuary, and partly from local, outer harbor sediments.

Characteristics of Dechlorination Systems H and H'. - The results show that the upper and middle Acushnet Estuary PCBs are undergoing dechlorination by at least two closely related dechlorination systems, herein designated H and H', which can be characterized in detail as to their relative reactivities toward the various individual PCB congeners present in the Aroclor mixtures released (Figs. 2,3; Tables 1,2).

In Table 4 we summarize the derived information on chlorophenyl group reactivities for System H, and show comparable summaries for two other dechlorination systems: System B, which is one of four meta/para PCB-dechlorinating systems (B, B', C, and E) found in upper Hudson River sediments (11, 13) and System F, which is one of two ortho/meta/para PCB dechlorinating systems (F and G) found in the sediments of Silver Lake (Pittsfield, MA) (13). Also included in Table 4 is a list of the reported electrochemical reduction potentials of the various chlorophenyl groups (31), not because of any evidence that the environmental dechlorinations proceed by simple electron transfer reactions, but simply because these reduction potentials represent the only currently available indicators of the intrinsic chemical reactivities of the various chlorophenyl groupings toward reductive processes.

Table 4 shows that the susceptibility of chlorophenyl groups to attack by System H (indicated by "R" rather than "-" in Column H of the Table) does correlate to a fair extent with this index of reactivity, and also with the reactivity pattern shown by System F. Moreover, the pattern of chlorophenyl groups that appear in the dechlorinated product is also similar to that of System F. From this we may conclude that the intrinsic chemical reactivity, or reduction potential , of the agent responsible for System H must be quite similar to that responsible for F, and roughly equivalent to that of an Hg-Pt electrode set at -1.94 volts (relative to a standard calomel electrode in dimethyl sulfoxide). The equivalent potential for System H' may be slightly more negative, judging from the greater reactivity towards the borderline groups 2,3- and 2,3,6-CP.

However, the relative reactivities of the various PCB congeners towards Systems H and H' are clearly influenced by structural, or steric, effects as well as intrinsic susceptibilities to reduction. There would appear to be three sorts of steric effects involved: First, hindrance at the ortho (2 or 6) position by the opposite ring, regardless of chlorination pattern. As a result, we have a meta/para-selective dechlorination, like those of the upper Hudson river (11, 13), rather than the ortho/meta/para dechlorinations of Silver Lake Systems F and G (13). Second, hindrance by additional ortho substitution on the reacting ring. Thus, groups 2-,2,3,6-CP and 2,3,5,6- are progressively less reactive than 2,3-CP; and 2,3,4,6- and 2,3,4,5,6-CP are less reactive than 2,3,4-CP. This effect may be particularly significant when the ortho chlorine is located opposite the meta chlorine that is to be removed; thus, the reactivity of 3,4-CP is undepressed in 2,3,4-CP, but significantly so in 2,4,5-CP, and the same relative positioning (3 vs. 6, or 5 vs. 2) is also present in 2,3,6- and 2,3,5,6-CP. The third steric effect, shown by the vertical progressions in Table 4, is a general reduction in reactivity produced by substituents on the opposite ring, particularly when in ortho (2 or 6) positions.

The first and third of these steric effects are also exhibited by System B (and the other upper Hudson systems as well), but the second is unique to H and H'. It would appear that removal of a chlorine from position 3 by System H is inhibited by the presence of a chlorine in position 6, whereas for Systems B, B', or C the inhibition is greater if the blocking chlorine is in position 5 (13). At any event, System H is more reactive than B to 2,3,4-, 2,3,5-, 2,3,4,5-, and possibly also 2,3,4,6-CP groups, but less reactive to 2,4,5-, 2,3,6-, 2,3-, 2,4-, and 2,5-CPs. As a result of this reactivity pattern, an Aroclor that has undergone dechlorination by this system will develop the characteristic pattern of GC peak gains and losses that we have termed Pattern H (Figure 1): prominent declines in the peaks of almost all congeners containing 3,4-, 2,3,4-, 2,3,4,5-, or 3,4,5-CP groups, and corresponding increases in those containing 3-, 2,4-, 2,5-, or 3,5-CPs.

Toxicological Implications of System H Dechlorination. - In the U.S., the PCBs were widely used in the manufacture of electrical devices for nearly fifty years (1930-1978) without generating any findings of significant health effects (32-35). Concern over PCB toxicity arose in the 1970's after reports of widespread human poisoning in Japan caused by ingestion of rice oil ("yusho") that had been contaminated by PCBs (36). Eventually, further analyses of the rice oil identified polychlorinated dibenzofurans as the toxic contaminants, and the indictment of PCBs was withdrawn (37, 38). Meanwhile, however, studies with heavily dosed animals showed that a variety of toxic responses could be elicited, particularly by the more heavily chlorinated Aroclors, including hepatocellular carcinoma in rats (by Aroclor 1260) (39). Further studies with individual congeners then showed that only a very small subset of the 209 possible chlorinated biphenyls were active in producing observable toxic effects. These congeners were all found to be species having chlorines in both of the para (4 and 4') positions, in at least two of the four meta (3,3',5,5') positions, and in no more than one ortho (2 or 6) position. More specifically, a typical toxic response, thymic involution in rats, was elicited by 34-34, 345-4, 345-34, 345-345, 2345-4, 234-34, 2345-34, and 234-345 CB, but not by 34-4, 345-24, 245-34, 245-345, 2345-345, or any di-ortho substituted PCB (8). Three of the toxic congeners, namely 345-4, 345-34, and 345-345, have not been found in the commercial Aroclors; however, the other five are present at detectable levels (Appendix A). Thus, although occupational exposures of types permitting Aroclor (mixed PCB congener) uptakes up to several grams per year (5, 34) have not been sufficient to produce medically observable effects (32-35), the specific congeners of concern for their ability to produce toxic effects at still higher dosages are 34-34, 234-34, 234-345, 2345-4 and 2345-34.

Of secondary toxicological concern is the ability of a somewhat larger group of PCB congeners to induce the microsomal enzyme aromatic hydrocarbon hydroxylase (AHH), which has been more specifically identified in the rat as cytochrome P450c (8). This activity does not appear to be a component of the toxic response, but is frequently induced by the same pharmaceutical agents, and hence is often considered a warning sign. The Aroclor constituents that induce this response are the toxic congeners just listed, and also 34-4, 245-34, 345-24, 234-234, 234-245, 245-345, 2345-24, 2346-34, and 2345-234 CB (8).

Upon comparing these two lists of pharmacologically active PCB congeners with the lists of congeners attacked by Systems H and H' (Table 1), and their relative susceptibilities to attack (Tables 2, 4) a notable correlation emerges: All of the congeners that are of primary toxicological concern, as producing demonstrable toxicity in rats, are among the group that is most rapidly attacked by System H and H'. All those congeners that are of secondary toxicological concern, as being cytochrome P450c inducers, are either also among this group or among those that are only slightly less rapidly attacked. Thus, an Aroclor mixture being transformed by System H or H' will undergo loss of pharmacologically active congeners (detoxication) much faster than the overall rate of dechlorination.

An exact estimate of the extent of detoxication is somewhat complicated by the fact that the two congeners of greatest concern, 34-34 and 234-34 CB, both coelute with other, non-isomeric congeners on DB-1 capillary columns, so that the less reliable GC-MS data (e.g., Fig. 3) rather than the GC-ECD measurements (e.g., Figure 2) must be used for their quantitation. These data, along with the reactivity patterns of Tables 2 and 4, do show, however, that the toxic congeners are being removed at least as rapidly as the Peaks 50 and 58 that we have routinely used as indicators of dechlorination status. On this basis, Table 3 shows detoxication of at least 90% (3.3 half-clearances) in sediments 17B, 19B, and 22B) or at least 67% (1.6

half-clearances) averaged over all of the upper estuary sediment samples collected. The similar levels of toxic congener loss that occur in the mussels, crabs, and lobsters collected south of the hurricane barrier in the outer harbor are somewhat easier to observe, since the DB-5 gas chromatograms that were reported (17) provide greater separation of the 234-34 CB peak (IUPAC 105) from nearby congeners than does the DB-1 column that we used.

Microbial Ecology of System H. - As pointed out earlier (11, 13) there are no known environmental chemical agents having the negative reduction potentials or other activities needed to reductively dechlorinate aromatic chlorine compounds such as the PCBs, and no simple chemical agents of any type that show the steric selectivities exhibited by dechlorination systems B, B', C, E, H, and H'. Accordingly, these dechlorinating agents must be enzymes, presumably each associated with a specific strain of anaerobic bacteria. No PCB-dechlorinating bacteria have yet been isolated, nor is early success in such an endeavor likely, in view of the experimental difficulties normally attendant upon work with environmental anaerobes. However, it has been demonstrated through use of microbial inhibitors that the analogous dechlorinations of chlorobenzoic acids and chlorophenyls are microbially mediated (40, 41), and the same approach has recently been found to show that PCB dechlorination by upper Hudson sediments is also dependent upon microbial action (42). Thus, there appears no reason to doubt that agents H and H' are microbial.

The dechlorinase enzymes H and H' are clearly much more closely related to each other than to those of the other dechlorination systems found to date. This suggests the possibility that agents H and H' may be mutant varieties of the same microbial species.

The ecological relationships between environmental xenobiotics and environmental bacteria cover a range of patterns. At one extreme is the situation where the xenobiotic chemical is non-beneficially cometabolized by a variety of common endogenous microbes, with no resulting alteration in population distribution. The oxidative biodegradation of PCBs by aerobic bacteria (3,4) apparently fits this pattern: Many strains of bacteria having the ability to cometabolize PCBs have been discovered, but none can grow on PCB as a sole carbon source, and no population enhancements of the PCB-degrading aerobes in PCB-contaminated areas have been noted.

At the other extreme is the situation where the xenobiotic selectively favors the growth of a rare organism. This is normally manifested by a long induction period during which seeding, adaptation, and clonal expansion occur, followed by the appearance of a homogeneous population of xenobiotic-dependent organisms. PCB dechlorination in aquatic sediments appears to follow this latter pattern; we have thus far examined several hundred gas chromatograms (albeit of widely varying quality) from five different PCB spill sites where dechlorination is occurring, and found at least nine different dechlorination patterns, implying at least nine different strains of PCB-dechlorinating microbes. However, where multiple patterns have appeared at the same site, they generally appeared to be closely related (e.g., H and H'; in the Acushnet; B, B' and C in the upper Hudson; and F and G in Silver Lake); thus, the original seeding in each case could have involved only a single organism that then underwent mutation. At all spill sites, most individual sediment specimens have shown only a single pattern, implying a patchy distribution of the dechlorinating organisms in the sediments, each patch presumably representing a single clone. PCB-containing sediments that were not undergoing dechlorination as of the time of observation were seen downriver of the actively dechlorinating patches in both the upper Hudson (12) and the Acushnet. All of these observations suggest localized population blooms of otherwise very rare environmental bacteria.

It is a stoichiometric necessity that if some chemical species is being reduced, as the PCBs are when dechlorinated, some other species must be oxidized. Thus, the anaerobic bacteria that effect dechlorination must be using the PCBs as oxidizing agents (e.g., terminal electron acceptors) in their metabolic processes. We have shown earlier that this is strongly allowed on thermodynamic grounds; in fact, the free energy gain in oxidizing glucose (for example) to carbon dioxide and water using PCBs as the oxidants is calculated to be about three times that available from sulfate (13). Thus, the rare anaerobic bacterial strain that happens to possess enzyme systems that can effect PCB dechlorination should be at a selective advantage, and would be expected to proliferate. What is notable about the Acushnet dechlorinating strains H and H' is that they were evidently able to compete with the endogeneous sulfate-utilizing anaerobes even in estuarine sediments, where the sulfate level was found to be almost as high as in seawater (18).

Dechlorination Initiation and Rates. - As we saw above, it would appear that the upper and middle Acushnet estuary sediments have received between 100 and 200 metric tons of PCBs. Several minor routes of PCB entry into the estuary have been noted (14); however, the large quantities present are virtually inexplicable unless they be presumed to have occurred predominently in connection with ongoing manufacturing operations. This indicates the possible period for significant Aroclor 1254 release as between 1945 and 1965, and that for Aroclor 1242 as between 1962 and 1972. We have thus far been unable to detect any Aroclor 1016 (in manufacturing use 1970–78) in the sediments. Presumably, the growing concerns over environmental accumulation that led to the switchover to Aroclor 1016 beginning in 1970 also led to a curtailing of practices leading to releases.

In order to estimate the absolute rates of System H dechlorination from this chronology, we shall make two presumptions. The first is that the dechlorination process, once past the induction period, proceeded according to first order kinetics. This conventional presumption is not yet demonstrated for System H; however, for the analogous System B of the upper Hudson we have seen one core where the expected linear relationship between half-clearance number and depth was maintained over 30 cm. The second is that the intrinsic reactivities of the Aroclor 1242-associated Peak 50 (mainly 23-34 CB) and the Aroclor 1254-associated Peak 58 (234-25 CB) are about the same. This is the same presumption as that previously used in deriving a single scale for Table 2, and is based upon the identity of the mean numbers of half-clearances of these two peaks, when averaged over all sites listed in Table 3.

The first presumption means that we may take all of the "numbers of half-clearances" listed on the last three columns of Table 3 as equivalent to the numbers of half-times that the dechlorination has been proceeding. Thus, in the most advanced sediments of the northern end of the upper estuary, e.g., 17B, 19B, and 22B, we conclude that Peak 58 (and also those of the other Aroclor 1254-associated 234-XY CBs) has undergone about 3.5 half-times of clearance. The second presumption tells us that in these more northerly sediments there was an approximately one half-time time lapse between the time of initiation of the Aroclor 1254 dechlorination and the mean arrival time of Aroclor 1242 in the subsurface zone where dechlorination was occurring (last column, Table 3). If we conservatively estimate the mean time of deposition of the Aroclor 1242 as roughly 1966, and the sample was collected in 1986, this means that the 2.5 half-times of dechlorination that elapsed after the arrival of the 1242 in the dechlorination zone took 20 years. if there was no transit time between deposition and arrival, or perhaps 15 years if there was a 5-year delay during which downward diffusion and/or burial occurred, indicating respective values of 8 and 6 years for the half-time. Consideration of the observed variances and uncertainties in the values used in this calculation indicates that the t-1/2 for Peak 58 (234-25 CB) removal in actively dechlorinating sediments should be estimated as 7+3 years.

This number is equivalent to giving the period of active dechlorination of the sediments used for determining the relative rate data of Table 2 as 25$\pm$10 years. Thus, the actual dechlorination t-1/2 for any of the individual congeners listed in Table 3 can be determined by dividing 25$\pm$10 by the number of half-clearances given in the Table.

All such t-1/2 values refer, of course, to sediment strata where dechlorination is actively progressing. However, it is very likely that there may be a thin layer at the surface that is too aerobic for anaerobic bacterial growth. For the PCBs in this zone to dechlorinate, they must diffuse down into the active layers. Table 3 indicates that relative to the presumably fully active lower ("B") layer, the extent of dechlorination was 20-25% lower in the upper ("A") layer, or about 10-15% lower for the average of the two, which is probably representative of the average for the sediment column as a whole. Thus, while the clearance t-1/2 for species like 234-25 CB in the active layers of the sediments can be stated as 7±3 years it probably should be stated as 8±3 years for the whole of the PCBs present.

We can now use the differences in the relative extents of dechlorination of the Aroclor 1254-derived peaks (last column. Table 3) to sketch out a chronology of events. First, there were sizeable releases of Aroclor 1254 on various occasions within the period 1945 to 1965. Next, organism H appeared in PCB-adapted form, probably near the north end of the estuary. It was probably established in several locations, e.g., our sampling sites 17, 19, and 22, by the late 1950's; in the remainder of the northern half of the upper estuary (with the probable exception of site 18) by the time of the switchover to Aroclor 1242 (1962-65), and in most sites in the southern half of the upper estuary during the mid-1960's. During the period of spread, either a second seeding or mutation occurred, giving organism H'. This became established in one small area near sites 9 and 12, which are within 100m of each other. Also during this period a limited seeding of the Aroclor 1254 deposits in the ERFB sewer line occurred, possibly via sewage overflow connections that permit reverse flow into the sewer system during periods of high water levels (14). Sizeable releases of Aroclor 1242 to the upper estuary presumably then occurred on various occasions within the period 1962-1971, along with continued colonization of subsurface sediment layers by anaerobe H. In the absence of capillary GC data we cannot say when H reached the inner harbor; only that as of the time of the GCA sampling (1982-83) dechlorination was well along at all sites north of the hurricane barrier, but not to the south.

<u>Future Course of Acushnet Sediment Dechlorination</u>. - Presuming that all sedi-

ments north of the hurricane barrier are now seeded with the agent responsible for System H (or H') dechlorination, and that this dechlorination will continue to proceed in the future as it has over the past 25 years, we may project its future course. Our projection must, however, take into account the facts that the commercial Aroclors that were released into the estuary were complex mixtures of PCB congeners having quite different dechlorination rates, and also posing quite different levels of environmental concern. Of greatest concern must be those congeners that actually produce toxic effects or unusual enzyme inductions in animals; notably, those containing only 3,4-, 2,3,4-, 3,4,5-, and 2,3,4,5-CP groups attached to each other. Fortunately, it happens that these are also the groups most rapidly attacked by System H (Table 2). Judging overall detoxication (probably conservatively) by the disappearance rate of Peak 58 (234-25 CB), about 67% of these congeners have already been lost from the upper estuary (1.6 half-losses; Table 3). Overall average reduction to the 90% level (3.2 half-losses) will accordingly require 1.6 additional half-times, or 13±5 years. Further declines in the levels of toxic congeners in the upper estuary sediments will probably not have much further effect on those in outer harbor fish and shellfish, since these organisms will be exposed to water-borne PCBs originating in undechlorinated outer harbor sediments as well as those of the upper estuary.

Of secondary concern will be those PCB congeners which, while not particularly toxic, do show considerable persistence in crustaceans, birds, mammals, and man. This is because it is these persistent congeners that determine the total levels of PCBs actually measured in the blood or tissues of these species, and thus serve as a basis for regulatory actions. The most persistent PCB congeners in all these groups of species (which share the ability to biodegrade most PCB congeners by microsomal oxidases of the cytochrome P450 type) are those having a 2,4,5-or 2,3,4,5-CP group attached to any other 4-substituted CP, e.g., 4-, 2,4-, 3,4-, 2,3,4-, 2,4,5-, etc. (5,6). System H does attack all of these congeners, but sometimes only slowly, notably in the case of 245-245 CB, for which the t-1/2 may be estimated only roughly from the available data (Table 2) as about 35 years. We estimate that to achieve 90% overall reduction in the level of P450-resistant congeners in the sediments will require 2 half-losses of 245-245 CB, which equates to roughly 70 years, starting in 1965, or 50 years from the present. Again, further dechlorination beyond the 90% level may not be helpful, since the lobsters are exposed to water containing PCBs from undechlorinating sources as well. This calculation applies, of course, to the proportion of P450-resistant congeners in the PCBs of the upper and middle estuary sediments. The actual quantity of such congeners reaching the outer harbor lobsters will be additionally determined by future elution rates from the sediments.

Of tertiary concern will be those many PCB congeners that are neither more toxic nor more persistent (in higher animals) than the petroleum hydrocarbons that are present along with them but which are regulated as PCBs nevertheless. These congeners include those Aroclor constituents that are not attacked by System H in the first place (e.g., 25-4, 24-4, 26-34, 236-34 CB, etc.) or else are products of System H dechlorination (e.g., 2-3, 25-3, 24-3, 25-25, 25-24, 24-24 CB, etc.) These congeners will still contribute to the measured PCB levels in mussels and some fish (i.e., those lacking cytochrome P450 activity for degrading PCBs), but not significantly to those of lobsters, crabs, or warm blooded animals. Their total levels in upper estuary sediments will decline only as elution occurs. However, their levels in the surface layers of the sediments, and hence also their elution rates, concentrations in the upper estuary waters, and concentrations in lower estuary mussels should all continue to decline in response to elutriative depletion of the surface layers and continued sedimentation (29).

The foregoing projections assumed no change in the ongoing dechlorination system or its area of occupancy. Actually, of course, there are several alternative scenarios that should be considered. The most notable are (a) that System H may spread south into the outer harbor, (b) that System H may mutate to give a new strain with a broader range of PCB congener competence (like H'), (c) that the sediments may become seeded with some unrelated organism having the ability to utilize the congeners left unattacked by System H, a development that will become increasingly likely in the future as both the supply of H-dechlorinatable congeners and the population of System H organisms decline, and (d) that it may be decided to deliberately seed the sediments with an organism having a broader range of PCB congener competence, such as upper Hudson Systems C or E, or Silver Lake Systems F or G, or whatever other PCB-dechlorinating bacteria may be capable of survival in the Acushnet. The objectives of such seeding would be to accelerate the loss of P450-resistant congeners (which are attacked more rapidly by most other dechlorinating systems than by Systems H and H') and/or to carry the dechlorination all the way down to the mono- and dichlorobiphenyls, which would be more readily eluted from the sediments and also more readily biodegraded by aerobic microorganisms in the water.

In summary, for upper and middle estuary sediments, for upper, middle, and lower estuary waters, and for lower estuary (outer harbor) biota, a projection of current trends indicates a fairly rapid decline in the levels of those PCB congeners that are toxic in warm-blooded animals; a slower decline in those that are persistent but not toxic; and a still slower decline in the total PCB levels. However, there are conceivable developments that could speed up the natural processes by which detoxication and decontamination have been occurring.

Finally, we must add a cautionary note. The above projections are based upon observations of PCB transport and transformation processes that may be specific to the Acushnet estuary. Accordingly, they should not be used to predict the course of events at other PCB spill sites, unless the comparability of such processes has been established.

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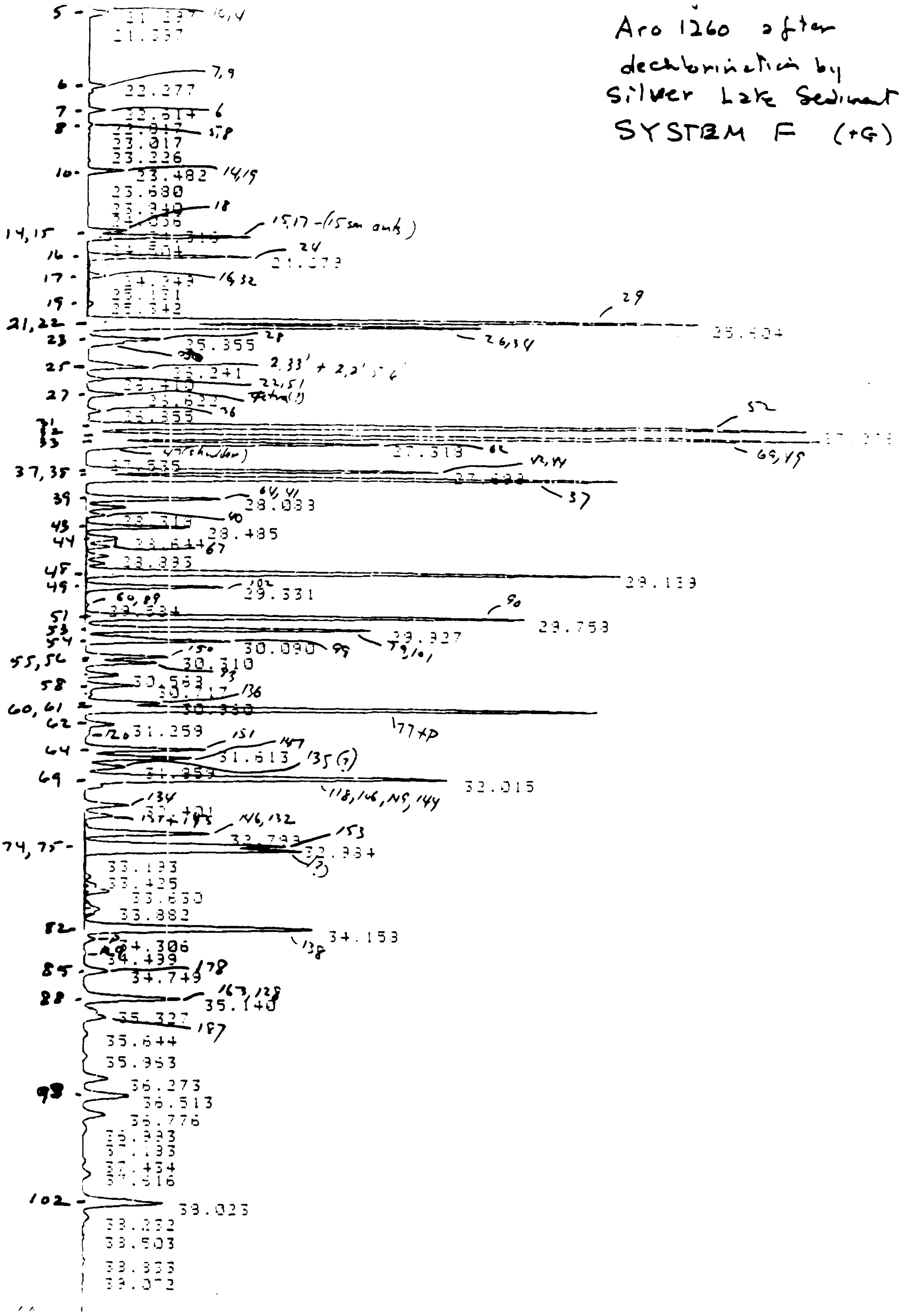
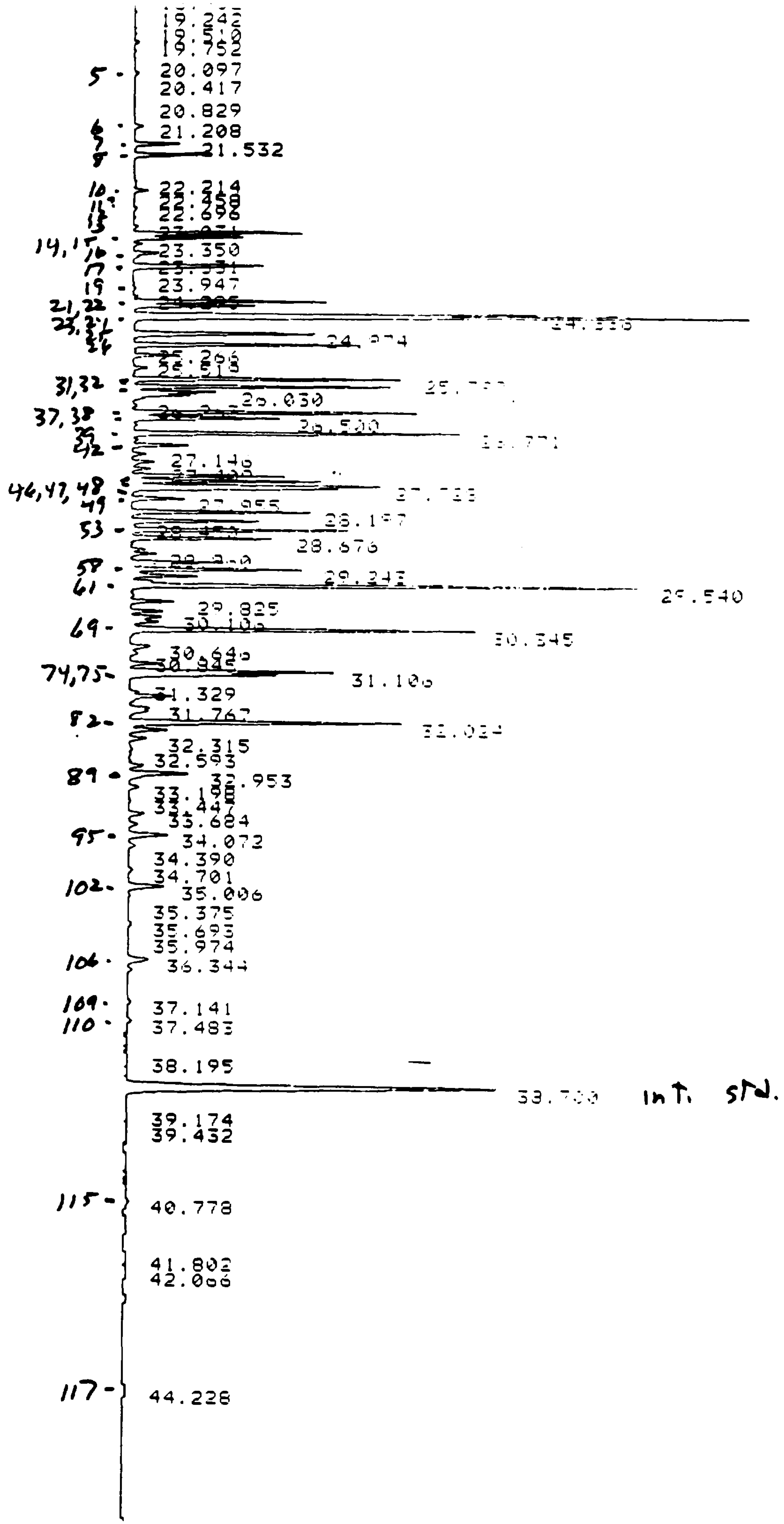
Aro 1260 after dechlorination by Silver Lake Sediment SYSTEM F (+G)



N.B.

2A



19.242
19.510
19.752
20.097
20.417
20.829
21.208
21.532
22.214
22.696
23.350
23.947
24.974
26.030
27.146
28.197
28.676
29.825
30.345
31.106
31.329
32.315
32.593
32.953
34.072
34.390
34.701
35.006
35.375
35.693
35.974
36.344
37.141
37.483
38.195
int. std.
39.174
39.432
40.778
41.802
42.066
44.228

MT32:NB2A.RES

N.B. 2A

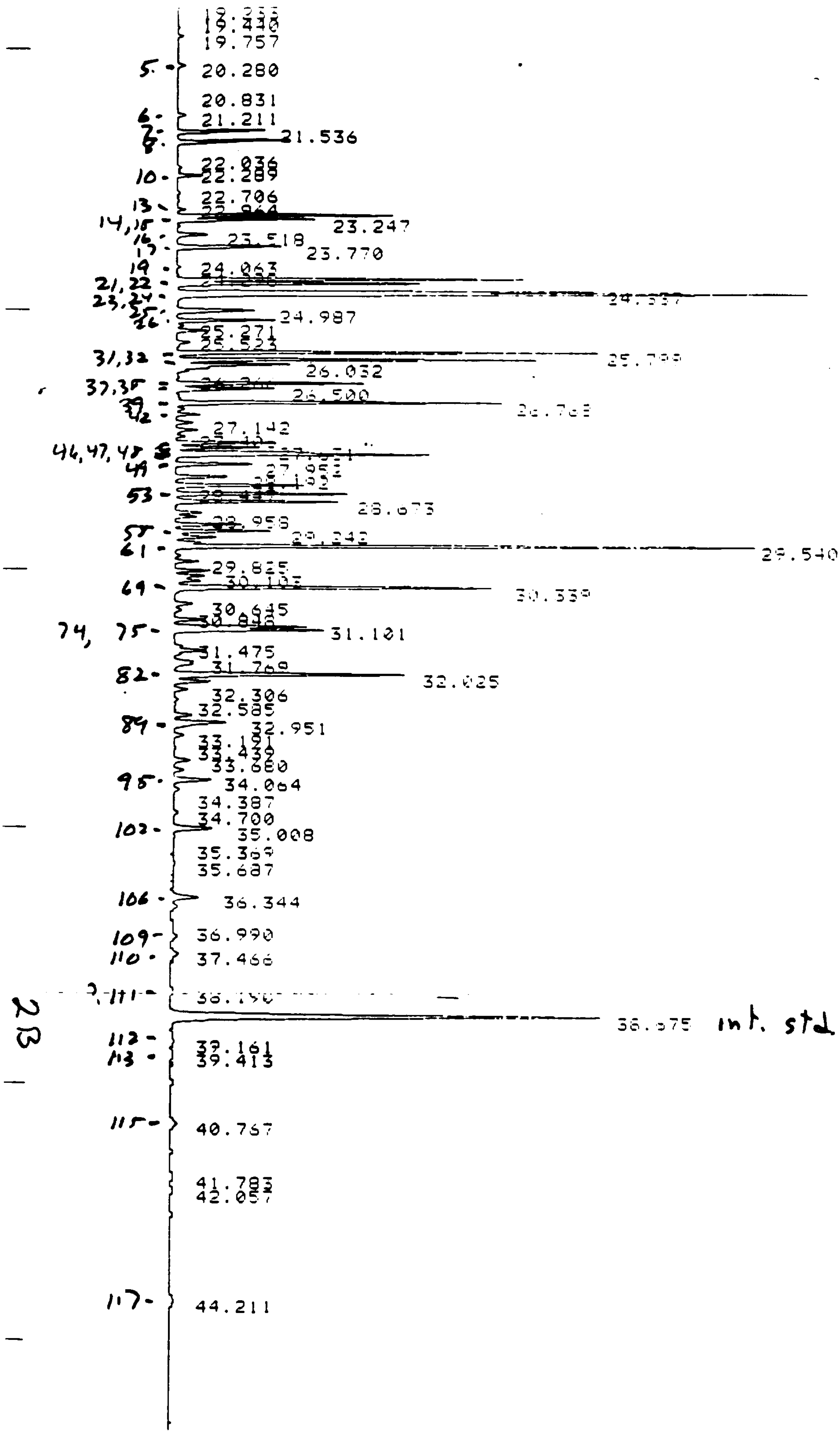
PEAK#	RLT. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.64	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.67	1:1	001	.1544	2	0.6544	0.9766
3	50.08	1:0	002	.1937	3	1.9187	2.8512
4	50.62	1:0	003	.1975	4	0.7360	1.0903
5	52.35	2:2	004 010	.2295	22' : 26	0.7358	0.9207
6	54.75	2:1	007 009	.2566	24 : 25	0.3549	0.4479
7	55.58	2:1	006	.2709	23'	1.4954	1.8874
8	56.1	2:1	005 008	.2785	23 : 24'	2.3248	2.9343
9	57.86	2:0	014	.2973	35	0.0427	0.0538
10	57.75	3:3	019	.3045	22'6	0.4894	0.5352
11	58.06	3:2	030	.3165	246	0.0040	0.0043
12	59.15	2:0	011	.3238	33'	0.0000	0.0000
13	59.46	2:0	012 013	.3297	34 : 34'	0.2401	0.3030
14	59.82	3:2 2:0	018 015	.3387	22'5 : 44'	5.6124	6.3937
15	60.02	3:2	017	.3398	22'4	2.8413	3.1071
16	60.72	3:2	024 027	.3508	236 : 23'6	0.4965	0.5429
17	61.34	3:2	016 032	.3625	22'3 : 24'6	2.6799	2.9306
18	62.12	3:1	023	.3770	235	0.0195	0.0213
19	62.32	3:1 4:4	034 054	.3800	2'35 : 22'66'	0.0713	0.0750
20	62.74	3:1	029	.3820	245	0.0512	0.0560
21	63	3:1	026	.3911	23'5	2.5994	2.8426
22	63.18	3:1	025	.3937	23'4	2.0063	2.1940
23	63.62	3:1	031	.4024	24'5	5.0778	5.5519
24	63.75	3:1 4:3	028 050	.4031	244' : 22'46	6.5779	7.1741
25	64.49	3:1 4:3	021 033	.4178	233' : 234 : 22'56'	3.0649	3.0272
26	65.01	3:1 4:3	022 051	.4267	234' : 22'46'	1.9269	2.0000
27	65.5	4:3	045	.4334	22'36	0.6955	0.6787
28	65.89	3:1	036	.4379	33'5	0.0000	0.0000
29	66.07	4:3	046	.4450	22'36'	0.4779	0.4609
30	66.45	3:1	039	.4480	34'5	0.0000	0.0000
31	66.61	4:2	052 073	.4554	22'55' : 23'5'6	5.4286	5.2273
32	66.90	4:2	049	.4610	22'45	3.5003	3.3755
33	67.21	4:2	047	.4639	22'44'	1.2975	1.2512
34	67.36	4:2	048 075	.4651	22'45 : 244'6	0.9367	0.9033
35	67.6	4:2	065 062	.4865	2346 : 2356	0.0000	0.0000
36	67.83	3:0	035	.4738	33'4	0.1040	0.1138
37	68.16	5:4 4:2	104 044	.4832	22'466' : 22'35'	3.4618	3.3345
38	68.42	3:0 4:2	037 042	.4870	344' : 22'34' : 234'6	2.7200	2.6448
39	69.15	4:2	064 071	.4990	23'34 : 234'6 : 23'4'6 +	2.7125	2.6157
40	69.25	4:1	068	.5040	23'45' 7	0.0000	0.0000
41	69.4	5:4	096	.5057	22'366'	0.1660	0.1432
42	69.69	4:2	040	.5104	22'33'	0.7657	0.7384
43	70.1	5:3 4:1	103 057	.5155	22'45'6 : 233'5	0.2210	0.2082
44	70.46	5:3 4:1	100 067	.5212	22'44'6 : 23'4'5	0.4274	0.3849
45	70.77	4:1	058 063	.5267	233'5' : 234'5	0.2478	0.2390
46	71.11	4:1 5:3	074 094	.5340	244'5 : 22'356'	1.4343	1.2916
47	71.37	4:1	070 061	.5407	23'4'5 : 2'345 : 23457	2.1684	2.0910
48	71.6	4:1 5:3	066 095	.5447	23'44' : 22'356 : 22'35'6	2.5118	2.1778
49	72.1	5:3 4:1	091 098	.5549	22'34'6 : 22'3'46 : 233'4	0.8065	0.7030
50	72.8	4:1	056 060	.5676	233'4' : 2344'	1.8051	1.7408
51	73.2	6:4 5:3	155 084	.5666	22'44'66' : 22'33'6: 22'355'	1.5800	1.3624
52	73.4	5:3	089	.5779	22'346'	0.0337	0.0291
53	73.6	5:2	101 090	.5814	22'34'5 : 22'455'	2.6448	2.2817
54	74	5:2	099	.5880	22'44'5	1.6078	1.3871
55	74.6	6:4 5:2	150 112	.5969	22'34'66' : 233'56 : 23'44'6	0.1265	0.1092
56	74.83	5:2	083 109	.6029	22'33'5 : 233'46	0.0000	0.0000
57	75.1	6:4 5:2	152 097	.6062	22'3566' : 22'345 : 22'3'45	0.8464	0.7261
58	75.5	5:2	087 111	.6175	22'345' : 233'55' : 2344'6	1.0760	0.9283
59	75.8	5:2	085 116	.6224	22'344' : 234567	0.4970	0.4287
60	76.1	6:4	136	.6257	22'33'66'	0.3067	0.2393
61	76.3	4:0 5:2	077 110	.6295	33'44' : 233'4'6	4.0402	3.4855
62	76.7	6:3	154	.6349	22'44'56'	0.0374	0.0291
63	77	5:2	082	.6453	22'33'4	0.3629	0.3131
64	77.4	6:3	151	.6499	22'355'6	0.3981	0.3106
65	77.7	6:3 5:1	135 124	.6563	22'33'56' : 2'344'5	0.4359	0.3501
66	77.9	6:3	144	.6584	22'345'6	0.2652	0.2069
67	78.01	5:1 6:3	107 108	.6628	233'4'5 : 233'45' : 22'34'56	0.0000	0.0000
68	78.3	5:1	123	.6658	2'344'5	4.1824	3.6082
69	78.41	6:3 5:1	149 118	.6672	22'34'5'6 : 23'44'5 : 233'45	0.0000	0.0000
70	78.7	6:3	139 140	.6707	22'344'6 : 22'344'6'	0.0034	0.0026
71	79.1	6:3 5:1	134 143	.6796	22'33'56' : 22'3456'; 2344'5	0.2866	0.2421
72	79.4	5:1 6:3	122 131	.6871	2'33'45; 22'33'46;22'33'55'+	0.1038	0.0859
73	79.9	6:2	146 161	.6955	22'34'55' : 233'45'6	0.3628	0.2831
74	80.3	6:3 5:1	132 105	.7035	22'33'46' : 233'44'	1.0375	0.8055
75	80.52	6:2	153	.7036	22'44'55'	0.0000	0.0000
76	81.2	6:2	168	.7068	23'44'5'6	0.0676	0.0527
77	81.5	6:2	141	.7203	22'3455'	0.2597	0.2026
78	81.7	7:4	179	.7205	22'33'566'	0.0000	0.0000
79	82	6:2	130	.7204	22'33'45'	0.2593	0.2023
80	82.2	6:2	137	.7329	22'344'5	0.0000	0.0000
81	82.35	7:4	176	.7385	22'33'466'	0.0000	0.0000
82	82.7	6:2	138 163	.7403	22'344'5' : 233'4'56 : +2	2.2823	1.7807
83	83	6:2	158	.7429	233'44'6	0.3490	0.2723
84	83.4	6:2	129	.7501	22'33'45	0.2206	0.1703
85	83.9	7:3	178	.7537	22'33'55'6	0.0577	0.0411
86	84.25	6:2	166	.7572	2344'56	0.0000	0.0000
87	84.4	7:3	175	.7611	22'33'45'6	0.0186	0.0133
88	84.7	7:3	187 182	.7653	22'34'55'6 : 22'344'56'	0.1638	0.1167
89	85.1	6:2	128	.7761	22'33'44'	0.5177	0.4039
90	85.4	7:3	183	.7720	22'344'5'6	0.0000	0.0000
91	85.76	6:1	167	.7814	23'44'55'	0.0000	0.0000
92	86.3	7:3	185	.7840	22'3455'6	0.0196	0.0140
93	87	7:3	174 181	.7965	22'33'456' : 22'344'56	0.1520	0.1084
94	87.4	7:3	177	.8031	22'33'4'56	0.1172	0.0837
95	88	7:3 6:1	171 156	.8105	22'33'44'6 : 233'44'5	0.4227	0.3206
96	88.44	8:4	202	.8809	22'33'55'66'	0.0000	0.0000
97	88.5	6:1	157	.8104	233'44'5'	0.0532	0.0415
98	88.8	7:3	173	.8152	22'33'456	0.0044	0.0031
99	89.2	8:4	200 204	.8197	22'33'45'66' : 22'344'566'	0.0051	0.0034
100	89.6	7:2	172 192	.8270	22'33'455' : 233'455'6	0.0666	0.0475
101	90.2	8:4	197	.8293	22'33'44'66'	0.0008	0.0000
102	90.4	7:2	180	.8362	22'344'55'	0.3143	0.2239
103	91	7:2	193	.8397	233'4'55'6	0.0013	0.0009
104	91.44	7:2	191	.8447	233'44'5'6	0.0000	0.0000
105	92.15	8:4	199	.8494	22'33'4566'	0.0000	0.0000
106	93.8	7:2	170	.8740	22'33'44'5	0.2071	0.1475
107	94.3	7:2	190	.8740	233'44'56	0.0537	0.0383
108	95.4	8:3	198	.8845	22'33'455'6	0.0017	0.0011
109	95.9	8:3	201	.8875	22'33'4'55'6	0.0527	0.0345
110	96.8	8:3	196 203	.8935	22'33'44'5'6 : 22'344'55'6	0.0515	0.0337
111	98.6	7:1	189	.9142	233'44'55'	0.0083	0.0059
112	101.1	8:3	195	.9321	22'33'44'56	0.0252	0.0165
113	101.8	9:4	208	.9328	22'33'455'66'	0.0060	0.0037
114	103.29	9:4	207	.9423	22'33'44'566'	0.0000	0.0000
115	105.3	8:2	194	.9628	22'33'44'55'	0.0394	0.0258
116	106.4	8:2	205	.9678	233'44'55'6	0.0000	0.0000
117	114.2	9:3	206	1.018	22'33'44'55'6	0.0570	0.0346
118	126.35	10:4	209	1.050	22'33'44'55'66'	0.0000	0.0000

CONCENTRATION = 2.751815
TOTAL MICROMOLES = 0.0090

AVERAGE MOLECULAR WEIGHT = 281.58772
NUMBER OF CALIBRATED PEAKS FOUND = 118

N. B.

2 B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2B

MT32:N628.RES

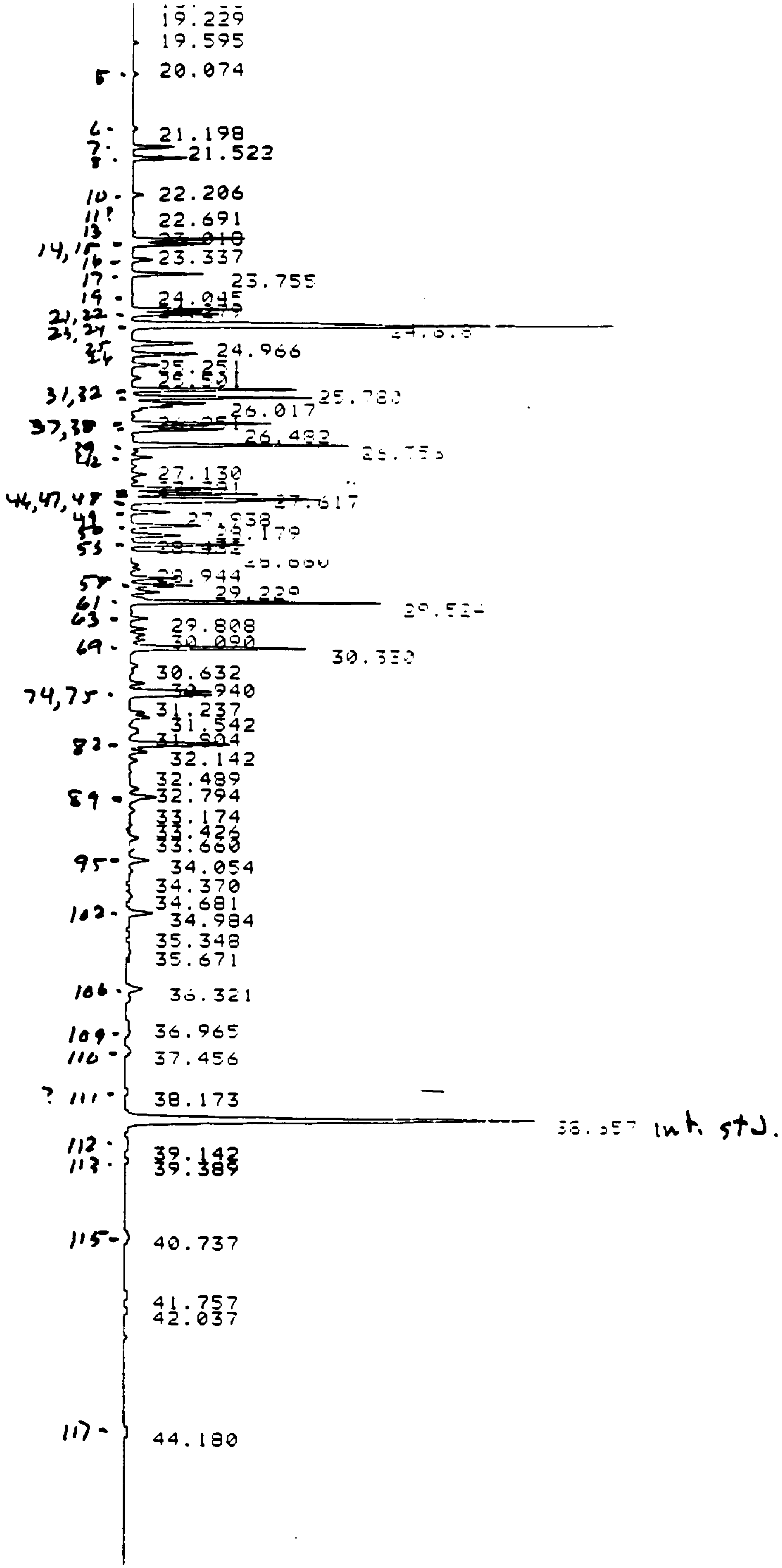
N.B 2B

PEAK#	RET. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.57	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.72	1:1	001	.1544	2	0.0000	0.0000
3	50.29	1:0	002	.1937	3	0.0000	0.0000
4	50.54	1:0	003	.1975	4	0.2190 ?	0.3176
5	52.27	2:2	004 010	.2245	22' ; 26	2.3357	2.8644
6	54.7	2:1	007 009	.2566	24 ; 25	0.7154	0.8773
7	55.53	2:1	006	.2709	23'	4.6591	5.7139
8	56.02	2:1	005 008	.2785	23 ; 24'	4.9843	6.1127
9	57.49	2:0	014	.2973	35	0.0000	0.0000
10	57.67	3:3	019	.3045	22'6	0.9000	0.9571
11	58.55	3:2	030	.3165	246	0.0353	0.0375
12	59.21	2:0	011	.3250	33'	0.0000	0.0000
13	59.4	2:0	012 013	.3297	34 ; 34'	0.4848	0.5946
14	59.74	3:2 2:0	018 015	.3387	22'5 ; 44'	10.6696	11.0103
15	59.95	3:2	017	.3390	22'4	5.5513	5.8985
16	60.64	3:2	024 027	.3508	236 ; 23'6	1.0234	1.0877
17	61.29	3:2	016 032	.3625	22'3 ; 24'6	2.5019	2.6584
18	62.04	3:1	023	.3770	235	0.0097	0.0103
19	62.43	3:1 4:4	034 054	.3800	2'35 ; 22'66'	0.0000	0.0000
20	62.66	3:1	029	.3820	245	0.0229	0.0243
21	62.92	3:1	026	.3911	23'5	3.9378	4.1841
22	63.22	3:1	025	.3937	23'4	0.0000	0.0000
23	63.54	3:1	031	.4024	24'5	7.6590	8.1380
24	63.77	3:1 4:3	028 050	.4031	244' ; 22'46	0.0000	0.0000
25	64.44	3:1 4:3	021 033	.4170	233' ; 234 ; 22'56'	1.5530	1.4903
26	64.95	3:1 4:3	022 051	.4267	234' ; 22'46'	0.0877	0.0953
27	65.42	4:3	045	.4334	22'36	0.9487	0.8889
28	65.79	3:1	036	.4379	33'5	0.0164	0.0174
29	65.99	4:3	046	.4450	22'36'	0.6757	0.6331
30	66.54	3:1	039	.4488	34'5	0.5417	0.0760
31	66.66	4:2	052 073	.4554	22'55' ; 23'5'6	0.0000	0.0000
32	66.92	4:2	049	.4610	22'45	5.2815	4.9488
33	67.16	4:2	047	.4639	22'44'	2.2498	2.1081
34	67.41	4:2	048 075	.4651	22'45 ; 244'6	0.1569	0.1470
35	67.6	4:2	065 062	.4665	2346 ; 2356	0.0000	0.0000
36	67.75	3:0	035	.4730	33'4	0.1540	0.1645
37	68.09	5:4 4:2	104 044	.4832	22'466' ; 22'35'	3.0200	2.8265
38	68.47	3:0 4:2	037 042	.4870	344' ; 22'34' ; 233'6	0.0000	0.0000
39	69.04	4:2	064 071	.4990	23'34 ; 234'6 ; 23'4'6 +	3.6099	3.3025
40	69.25	4:1	068	.5040	23'45' 7	0.0000	0.0000
41	69.42	5:4	096	.5057	22'366'	0.0000	0.0000
42	69.58	4:2	040	.5102	22'33'	0.3751	0.3515
43	70.02	5:3 4:1	103 057	.5155	22'45'6 ; 233'5	0.1364	0.1249
44	70.39	5:3 4:1	100 067	.5212	22'44'6 ; 23'4'5	0.6115	0.5351
45	70.7	4:1	058 063	.5267	233'5' ; 234'5	0.1302	0.1220
46	71.03	4:1 5:3	074 094	.5340	244'5 ; 22'356'	1.5204	1.3373
47	71.38	4:1	070 061	.5407	23'4'5 ; 2'345 ; 23457	0.0000	0.0000
48	71.52	4:1 5:3	066 095	.5447	23'44' ; 22'356 ; 22'35'6	3.0009	2.6022
49	72.09	5:3 4:1	091 098	.5549	22'34'6 ; 22'3'46 ; 233'4	0.9351	0.7928
50	72.74	4:1	056 060	.5676	233'4' ; 2344'	0.9305	0.8719
51	73.18	6:4 5:3	155 084	.5666	22'44'66' ; 22'33'6 ; 22'355'	1.0031	0.8362
52	73.59	5:3	089	.5779	22'346'	1.7727	1.4860
53	73.71	5:2	101 090	.5814	22'34'5 ; 22'455'	0.0000	0.0000
54	73.98	5:2	099	.5880	22'44'5	1.3081	1.1636
55	74.49	6:4 5:2	150 112	.5969	22'34'66' ; 233'56 ; 23'44'6	0.1360	0.1148
56	74.88	5:2	083 109	.6029	22'33'5 ; 233'46	0.0088	0.0074
57	75.11	6:4 5:2	152 097	.6062	22'3566' ; 22'345 ; 22'3'45	0.5405	0.4506
58	75.42	5:2	087 111	.6175	22'345' ; 233'55' ; 2344'6	0.4292	0.3598
59	75.76	5:2	085 116	.6224	22'344' ; 234567	0.3114	0.2610
60	76.2	6:4	136	.6257	22'33'66'	5.2638	3.9986
61	76.32	4:0 5:2	077 110	.6295	33'44' ; 233'4'6	0.0000	0.0000
62	76.64	6:3	154	.6349	22'44'56'	0.0494	0.0375
63	76.95	5:2	082	.6455	22'33'4	0.1586	0.1329
64	77.41	6:3	151	.6499	22'355'6	0.2833	0.2148
65	77.7	6:3 5:1	135 124	.6563	22'33'56' ; 2'344'5	0.3034	0.2368
66	77.93	6:3	144	.6584	22'345'6	0.1820	0.1385
67	78.01	5:1 6:3	107 108	.6628	233'4'5 ; 233'45' ; 22'34'56	0.0000	0.0000
68	78.29	5:1	123	.6650	2'344'5	3.0906	2.5974
69	78.41	6:3 5:1	149 118	.6672	22'34'5'6 ; 23'44'5 ; 233'45	0.0000	0.0000
70	78.55	6:3	139 140	.6707	22'344'6 ; 22'344'6'	0.0000	0.0000
71	79.07	6:3 5:1	134 143	.6796	22'33'56' ; 22'3456' ; 2344'5	0.1929	0.1583
72	79.55	5:1 6:3	122 131	.6871	2'33'45 ; 22'33'46 ; 22'34'55'+	0.0000	0.0000
73	79.87	6:2	146 161	.6955	22'34'55' ; 233'45'6	0.2347	0.1779
74	80.23	6:3 5:1	132 105	.7035	22'33'46' ; 233'44'	0.4431	0.3674
75	80.52	6:2	153	.7036	22'44'55'	0.0000	0.0000
76	81.19	6:2	168	.7068	23'44'5'6	0.0440	0.0333
77	81.57	6:2	141	.7203	22'3455'	0.0271	0.0205
78	81.7	7:4	179	.7265	22'33'566'	0.0000	0.0000
79	81.94	6:2	130	.7284	22'33'45'	0.1654	0.1254
80	82.2	6:2	137	.7329	22'344'5	0.0000	0.0000
81	82.35	7:4	176	.7305	22'33'466'	0.0000	0.0000
82	82.61	6:2	138 163	.7403	22'344'5' ; 233'4'56 ; +2	1.1715	0.0001
83	82.97	6:2	158	.7429	233'44'6	0.2391	0.1013
84	83.56	6:2	129	.7501	22'33'45	0.1422	0.1070
85	84.05	7:3	178	.7537	22'33'55'6	0.0286	0.0198
86	84.25	6:2	166	.7572	2344'56	0.0000	0.0000
87	84.4	7:3	175	.7611	22'33'45'6	0.0000	0.0000
88	84.62	7:3	187 182	.7654	22'34'55'6 ; 22'344'56'	0.1570	0.1087
89	85.01	6:2	128	.7761	22'33'44'	0.3098	0.2349
90	85.4	7:3	183	.7720	22'344'5'6	0.0000	0.0000
91	85.68	6:1	167	.7814	23'44'55'	0.1901	0.1441
92	86.25	7:3	185	.7848	22'3455'6	0.0194	0.0135
93	86.9	7:3	174 181	.7965	22'33'456' ; 22'344'56	0.1307	0.0907
94	87.46	7:3	177	.8031	22'33'4'56	0.0955	0.0663
95	87.88	7:3 6:1	171 156	.8105	22'33'44'6 ; 233'44'5	0.2656	0.1957
96	88.34	8:4	202	.8089	22'33'55'66'	0.0317	0.0202
97	88.55	6:1	157	.8104	233'44'5'	0.0000	0.0000
98	88.91	7:3	173	.8152	22'33'456	0.0000	0.0000
99	89.48	8:4	200 204	.8197	22'33'45'66' ; 22'344'566'	0.0497	0.0316
100	89.68	7:2	172 192	.8278	22'33'455' ; 233'455'6	0.0000	0.0000
101	90.31	8:4	197	.8293	22'33'44'66'	0.2963	0.1886
102	90.7	7:2	180	.8362	22'344'55'	0.0135	0.0094
103	90.91	7:2	193	.8397	233'4'55'6	0.0000	0.0000
104	91.44	7:2	191	.8447	233'44'5'6	0.0000	0.0000
105	92.04	8:4	199	.8494	22'33'4566'	0.0137	0.0087
106	93.7	7:2	170	.8740	22'33'44'5	0.1679	0.1162
107	94.44	7:2	190	.8748	233'44'56	0.0000	0.0000
108	95.7	8:3	198	.8845	22'33'455'6	0.0345	0.0219
109	95.99	8:3	201	.8875	22'33'4'55'6	0.0000	0.0000
110	96.05	8:3	196 203	.8935	22'33'44'5'6 ; 22'344'55'6	0.0000	0.0000
111	98.72	7:1	189	.9142	233'44'55'	0.0000	0.0000
112	100.9	8:3	195	.9321	22'33'44'56	0.0156	0.0099
113	101.87	9:4	208	.9320	22'33'455'66'	0.0000	0.0000
114	103.29	9:4	207	.9423	22'33'44'566'	0.0000	0.0000
115	105.1	8:2	194	.9620	22'33'44'55'	0.0484	0.0308
116	106.77	8:2	205	.9678	233'44'55'6	0.0000	0.0000
117	114.24	9:3	206	1.010	22'33'44'55'6	0.0000	0.0000
118	126.35	10:4	209	1.050	22'33'44'55'66'	0.0000	0.0000

CONCENTRATION = 2.566853
TOTAL MICROMOLES = 0.0094

AVERAGE MOLECULAR WEIGHT = 273.6050
NUMBER OF CALIBRATED PEAKS FOUND = 118

N. B.
5 A



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5A

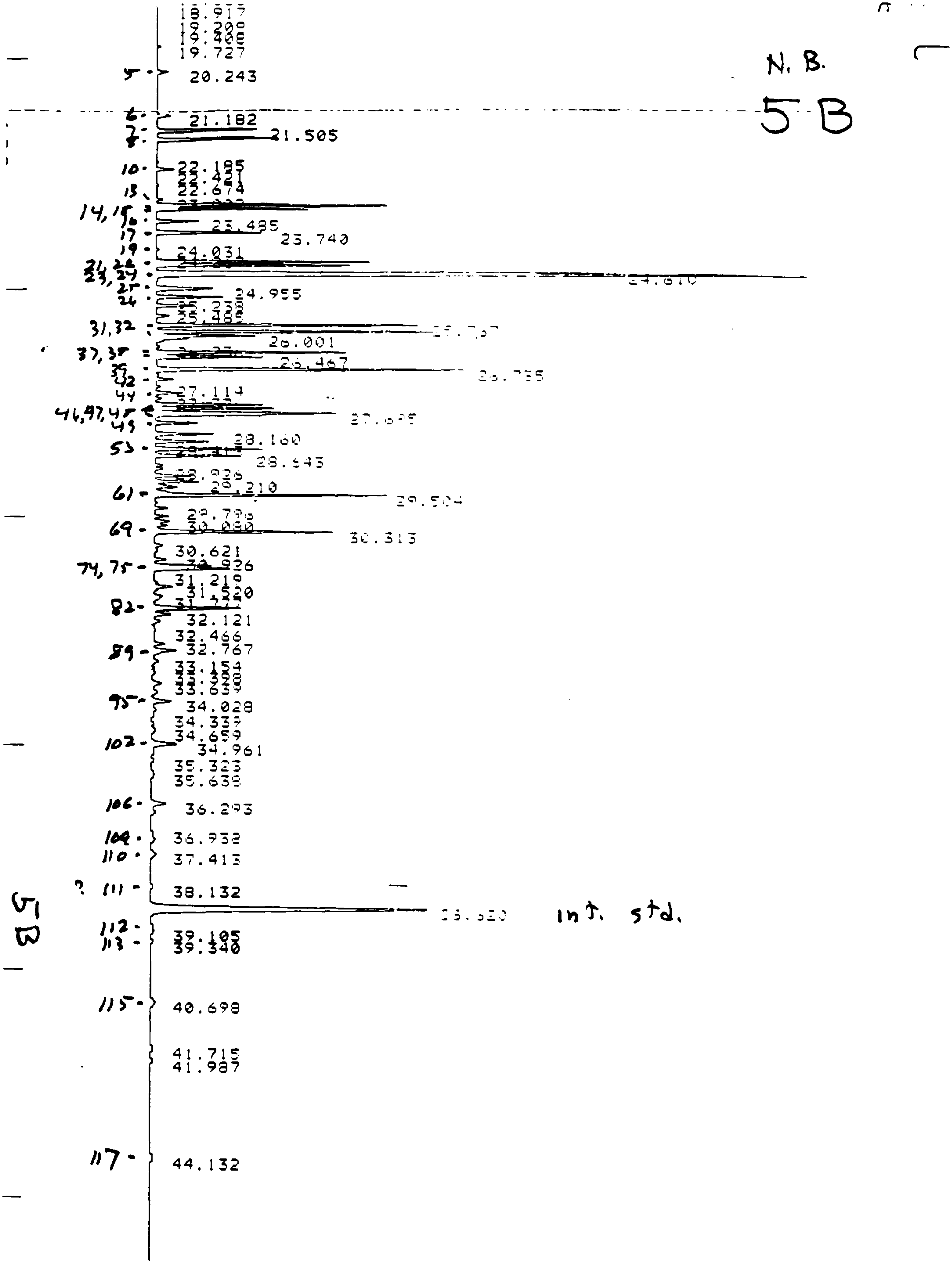
MT32:NB5A.RES

N.B. 5A

PEAK#	RET. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.64	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.72	1:1	001	.1544	2	0.0000	0.0000
3	50.29	1:0	002	.1937	3	0.0000	0.0000
4	50.62	1:0	003	.1975	4	0.5761	0.6695
5	52.35	2:2	004 010	.2245	22' + 26	1.4077	1.7972
6	54.76	2:1	007 009	.2566	24 + 25	0.3285	0.4194
7	55.61	2:1	006	.2709	23'	2.1489	2.7435
8	56.1	2:1	005 008	.2785	23 + 24'	2.6878	3.4315
9	57.47	2:0	014	.2973	35	0.0417	0.0533
10	57.75	3:3	019	.3045	22'6	0.6808	0.7619
11	58.63	3:2	030	.3165	246	0.0517	0.0571
12	59.23	2:0	011	.3238	33'	0.0000	0.0000
13	59.46	2:0	012 013	.3297	34 + 34'	0.2461	0.3141
14	59.82	3:2 2:0	018 015	.3387	22'5 + 44'	6.2248	7.1730
15	60.04	3:2	017	.3398	22'4	3.5465	3.9230
16	60.7	3:2	024 027	.3508	236 + 23'6	0.6633	0.7337
17	61.37	3:2	016 032	.3625	22'3 + 24'6	1.9651	2.1737
18	62.1	3:1	023	.3770	235	0.0085	0.0094
19	62.43	3:1 4:4	034 054	.3800	2'35 + 22'66'	0.0000	0.0000
20	62.72	3:1	029	.3820	245	0.0201	0.0222
21	62.98	3:1	026	.3911	23'5	2.4144	2.6706
22	63.18	3:1	025	.3937	23'4	2.1623	2.3918
23	63.6	3:1	031	.4024	24'5	4.6367	5.1289
24	63.75	3:1 4:3	028 050	.4031	244' + 22'46	0.1435	0.9837
25	64.5	3:1 4:3	021 033	.4170	233' + 234 + 22'56'	1.7975	1.7958
26	64.99	3:1 4:3	022 051	.4267	234' + 22'46'	1.0030	1.0530
27	65.48	4:3	045	.4334	22'36	0.8232	0.8030
28	65.87	3:1	036	.4379	33'5	0.0144	0.0159
29	66.08	4:3	046	.4450	22'36'	0.6079	0.5930
30	66.45	3:1	039	.4488	34'5	0.0000	0.0000
31	66.6	4:2	052 073	.4554	22'55' + 23'5'6	5.3435	5.2123
32	66.98	4:2	049	.4618	22'45	4.2329	4.1289
33	67.22	4:2	047	.4639	22'44'	1.9163	1.8693
34	67.37	4:2	048 075	.4651	22'45 + 244'6	1.0034	0.9788
35	67.6	4:2	065 062	.4865	2346 + 2356	0.0000	0.0000
36	67.84	3:0	035	.4738	33'4	0.1470	0.1626
37	68.15	5:4 4:2	104 044	.4832	22'466' + 22'35'	2.7938	2.7221
38	68.43	3:0 4:2	037 042	.4870	344' + 22'34' + 233'6	2.7572	2.7119
39	69.13	4:2	064 071	.4998	23'34 + 234'6 + 23'4'6 +	3.1721	3.0942
40	69.25	4:1	068	.5048	23'45' 7	0.0000	0.0000
41	69.39	5:4	096	.5057	22'366'	0.3496	0.3087
42	69.67	4:2	040	.5102	22'33'	0.4715	0.4599
43	70.09	5:3 4:1	103 057	.5155	22'45'6 + 233'5	0.1547	0.1474
44	70.45	5:3 4:1	100 067	.5212	22'44'6 + 23'4'5	0.4647	0.4232
45	70.78	4:1	058 063	.5267	233'5' + 234'5	0.1585	0.1546
46	71.12	4:1 5:3	074 094	.5340	244'5 + 22'356'	1.6219	1.4773
47	71.35	4:1	070 061	.5407	23'4'5 + 2'345 + 23457	2.3999	2.3418
48	71.59	4:1 5:3	066 095	.5447	23'44' + 22'356 + 22'35'6	3.2861	2.8819
49	72.18	5:3 4:1	091 098	.5549	22'34'6 + 22'3'46 + 233'4	0.9294	0.8195
50	72.83	4:1	056 060	.5676	233'4' + 2344'	1.3983	1.3640
51	73.24	6:4 5:3	155 084	.5666	22'44'66' + 22'33'6 + 22'355'	1.1491	0.9972
52	73.49	5:3	089	.5779	22'346'	0.0000	0.0000
53	73.68	5:2	101 090	.5814	22'34'5 + 22'455'	2.3768	2.0734
54	74.07	5:2	099	.5888	22'44'5	1.7292	1.5090
55	74.58	6:4 5:2	150 112	.5969	22'34'66' + 233'56 + 23'44'6	0.1605	0.1480
56	74.79	5:2	083 109	.6029	22'33'5 + 233'46	0.2690	0.2354
57	75.2	6:4 5:2	152 097	.6062	22'3566' + 22'345 + 22'3'45	0.7688	0.6672
58	75.52	5:2	087 111	.6175	22'345' + 233'55' + 2344'6	0.6719	0.5864
59	75.83	5:2	085 116	.6224	22'344' + 234567	0.4157	0.3627
60	76.13	6:4	136	.6257	22'33'66'	0.0000	0.0000
61	76.29	4:0 5:2	077 110	.6295	33'44' + 233'4'6	3.2226	2.8122
62	76.73	6:3	154	.6349	22'44'56'	0.0541	0.0427
63	77.01	5:2	082	.6453	22'33'4	0.2630	0.2295
64	77.48	6:3	151	.6499	22'355'6	0.3387	0.2675
65	77.74	6:3 5:1	135 124	.6563	22'33'56' + 2'344'5	0.3760	0.3055
66	77.9	6:3	144	.6584	22'345'6	0.0000	0.0000
67	78	5:1 6:3	107 108	.6628	233'4'5 + 233'45' + 22'34'56	0.3144	0.2659
68	78.25	5:1	123	.6658	2'344'5	0.0000	0.0000
69	78.38	6:3 5:1	149 118	.6672	22'34'5'6 + 23'44'5 + 233'45	3.3778	2.7437
70	78.55	6:3	139 140	.6787	22'344'6 + 22'344'6'	0.0000	0.0000
71	79.16	6:3 5:1	134 143	.6796	22'33'56' + 22'3456' + 2344'5	0.2359	0.2015
72	79.47	5:1 6:3	122 131	.6871	2'33'45 + 22'33'46 + 22'33'55' +	0.0927	0.0776
73	79.96	6:2	146 161	.6955	22'34'55' + 233'45'6	0.3087	0.2436
74	80.32	6:3 5:1	132 105	.7035	22'33'46' + 233'44'	0.7080	0.6112
75	80.48	6:2	153	.7036	22'44'55'	2.7641	2.1815
76	81.31	6:2	168	.7064	23'44'5'6	0.1810	0.1435
77	81.49	6:2	141	.7203	22'3455'	0.2115	0.1669
78	81.67	7:4	179	.7205	22'33'566'	0.0925	0.0667
79	82.06	6:2	130	.7284	22'33'45'	0.2064	0.1629
80	82.19	6:2	137	.7329	22'344'5	0.2112	0.1666
81	82.35	7:4	176	.7385	22'33'466'	0.0000	0.0000
82	82.73	6:2	138 163	.7404	22'344'5' + 233'4'56 + +2	1.6174	1.2765
83	83.06	6:2	158	.7429	233'44'6	0.2940	0.2327
84	83.45	6:2	129	.7501	22'33'45	0.1825	0.1440
85	83.94	7:3	178	.7537	22'33'55'6	0.0410	0.0301
86	84.10	6:2	166	.7572	2344'56	0.0111	0.0087
87	84.46	7:3	175	.7611	22'33'45'6	0.0122	0.0088
88	84.74	7:3	187 182	.7653	22'34'55'6 + 22'344'56'	0.1956	0.1409
89	85.11	6:2	128	.7761	22'33'44'	0.4307	0.3399
90	85.4	7:3	183	.7770	22'344'5'6	0.0000	0.0000
91	85.7	6:1	167	.7814	23'44'55'	0.2390	0.1887
92	86.37	7:3	185	.7846	22'3455'6	0.0227	0.0164
93	86.99	7:3	174 181	.7969	22'33'456' + 22'344'56	0.1593	0.1150
94	87.48	7:3	177	.8031	22'33'4'56	0.1164	0.0842
95	88	7:3 6:1	171 156	.8105	22'33'44'6 + 233'44'5	0.3584	0.2750
96	88.47	8:4	202	.8089	22'33'55'66'	0.0457	0.0303
97	88.55	6:1	157	.8104	233'44'5'	0.0000	0.0000
98	88.91	7:3	173	.8152	22'33'456	0.0000	0.0000
99	89.36	8:4	200 204	.8197	22'33'45'66' + 22'344'566'	0.0000	0.0000
100	89.6	7:2	172 192	.8270	22'33'455' + 233'455'6	0.0797	0.0574
101	90.2	8:4	197	.8298	22'33'44'66'	0.0000	0.0000
102	90.4	7:2	180	.8362	22'344'55'	0.3436	0.2476
103	90.91	7:2	193	.8397	233'4'55'6	0.0000	0.0000
104	91.5	7:2	191	.8447	233'44'5'6	0.0047	0.0034
105	92.1	8:4	199	.8494	22'33'4566'	0.0261	0.0173
106	93.8	7:2	170	.8740	22'33'44'5	0.2138	0.1535
107	94.3	7:2	190	.8748	233'44'56	0.0566	0.0408
108	95.63	8:3	198	.8849	22'33'455'6	0.0000	0.0000
109	95.9	8:3	201	.8875	22'33'4'55'6	0.0567	0.0376
110	96.7	8:3	196 203	.8935	22'33'44'5'6 + 22'344'55'6	0.0721	0.0478
111	98.72	7:1	189	.9142	233'44'55'	0.0000	0.0000
112	101.1	8:3	195	.9321	22'33'44'56	0.0192	0.0127
113	101.87	9:4	208	.9320	22'33'455'66'	0.0000	0.0000
114	103.29	9:4	207	.9483	22'33'44'566'	0.0000	0.0000
115	105.2	8:2	194	.9620	22'33'44'55'	0.0626	0.0415
116	106.77	8:2	205	.9670	233'44'55'6	0.0000	0.0000
117	114.1	9:3	206	1.010	22'33'44'55'6	0.0344	0.0211
118	126.35	10:4	209	1.050	22'33'44'55'66'	0.0000	0.0000

CONCENTRATION = 1.653279
TOTAL MICROMOLES = 0.0058

AVERAGE MOLECULAR WEIGHT = 264.83194
NUMBER OF CALIBRATED PEAKS FOUND = 118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MT32:NB5B.RES

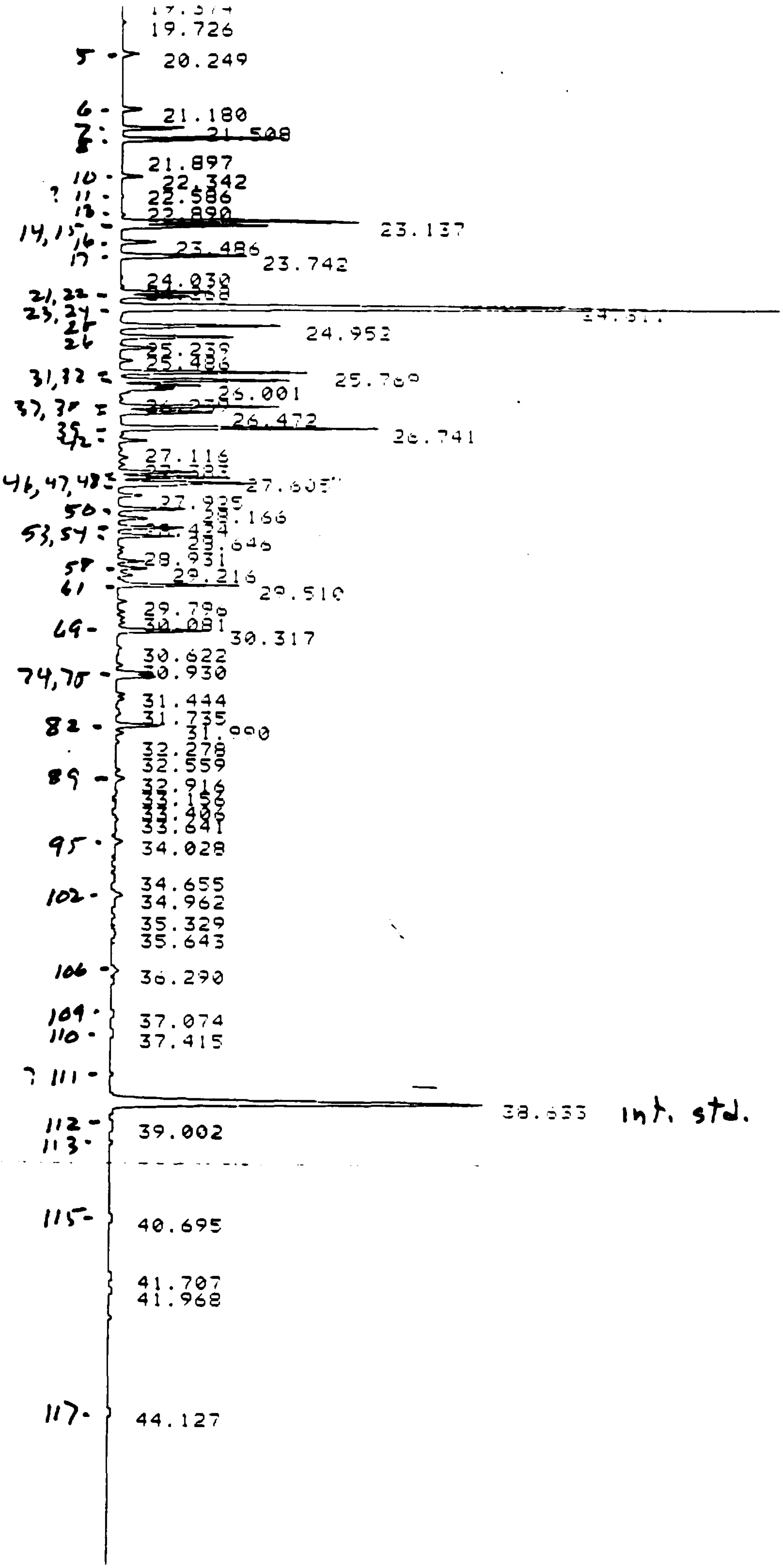
NB 5B

PEAK#	RLT. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.61	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.72	1:1	001	.1544	2	0.0000	0.0000
3	50.29	1:0	002	.1937	3	0.0000	0.0000
4	50.59	1:0	003	.1975	4	0.1859	0.2705
5	52.33	2:2	004 010	.2245	22' ; 26	1.9829	2.4390
6	54.76	2:1	007 009	.2566	24 ; 25	0.6073	0.7473
7	55.59	2:1	006	.2709	23'	3.9554	4.8668
8	56.08	2:1	005 008	.2785	23 ; 24'	4.2315	5.2065
9	57.49	2:0	014	.2973	35	0.0000	0.0000
10	57.73	3:3	019	.3045	22'6	0.7697	0.8152
11	58.59	3:2	030	.3165	246	0.0308	0.0320
12	59.21	2:0	011	.3238	33'	0.0000	0.0000
13	59.47	2:0	012 013	.3297	34 ; 34'	0.4116	0.5064
14	59.8	3:2 2:0	018 015	.3387	22'5 ; 44'	9.0580	10.0594
15	60.01	3:2	017	.3398	22'4	4.7128	5.0241
16	60.71	3:2	024 027	.3508	236 ; 23'6	0.0690	0.9264
17	61.35	3:2	016 032	.3625	22'3 ; 24'6	2.1240	2.2643
18	62.1	3:1	023	.3770	235	0.0082	0.0087
19	62.31	3:1 4:4	034 054	.3800	2'35 ; 22'66'	0.0721	0.0739
20	62.72	3:1	029	.3820	245	0.0194	0.0207
21	62.98	3:1	026	.3911	23'5	3.3430	3.5638
22	63.16	3:1	025	.3937	23'4	3.3288	3.5487
23	63.6	3:1	031	.4024	24'5	6.5021	6.9316
24	63.73	3:1 4:3	028 050	.4031	244' ; 22'46	8.5169	9.0551
25	64.51	3:1 4:3	021 033	.4170	233' ; 234 ; 22'56'	1.3184	1.2694
26	65	3:1 4:3	022 051	.4267	234' ; 22'46'	0.7537	0.7626
27	65.49	4:3	045	.4334	22'36	0.8054	0.7571
28	65.85	3:1	036	.4379	33'5	0.0139	0.0148
29	66.06	4:3	046	.4450	22'36'	0.5736	0.5392
30	66.45	3:1	039	.4468	34'5	0.0000	0.0000
31	66.6	4:2	052 073	.4554	22'55' ; 23'5'6	5.6045	5.2687
32	66.99	4:2	049	.4610	22'45	4.4838	4.2151
33	67.23	4:2	047	.4639	22'44'	1.9100	1.7956
34	67.33	4:2	048 075	.4651	22'45 ; 244'6	0.5642	0.5304
35	67.6	4:2	065 062	.4865	2346 ; 2356	0.0000	0.0000
36	67.82	3:0	035	.4738	33'4	0.1314	0.1401
37	68.16	5:4 4:2	104 044	.4832	22'466' ; 22'35'	2.5639	2.4075
38	68.42	3:0 4:2	037 042	.4870	344' ; 22'34' ; 233'6	2.5607	2.4274
39	69.11	4:2	064 071	.4990	23'34 ; 234'6 ; 23'4'6 +	3.0647	2.8811
40	69.25	4:1	068	.5040	23'45' 7	0.0000	0.0000
41	69.42	5:4	096	.5057	22'366'	0.0000	0.0000
42	69.66	4:2	040	.5102	22'33'	0.3184	0.2994
43	70.1	5:3 4:1	103 057	.5155	22'45'6 ; 233'5	0.1158	0.1063
44	70.46	5:3 4:1	100 067	.5212	22'44'6 ; 23'4'5	0.5192	0.4557
45	70.77	4:1	058 063	.5267	233'5' ; 234'5	0.1108	0.1039
46	71.11	4:1 5:3	074 094	.5340	244'5 ; 22'356'	1.2975	1.1390
47	71.34	4:1	070 061	.5407	23'4'5 ; 2'345 ; 23457	1.6986	1.5968
48	71.6	4:1 5:3	066 095	.5447	23'44' ; 22'356 ; 22'35'6	2.6229	2.2169
49	72.17	5:3 4:1	091 098	.5549	22'34'6 ; 22'3'46 ; 233'4	0.7938	0.6746
50	72.81	4:1	056 060	.5676	233'4' ; 2344'	0.7899	0.7426
51	73.25	6:4 5:3	155 084	.5666	22'44'66' ; 22'33'6; 22'355'	0.8516	0.7122
52	73.43	5:3	089	.5779	22'346'	0.0053	0.0049
53	73.67	5:2	101 090	.5814	22'34'5 ; 22'455'	1.5999	1.3486
54	74.05	5:2	099	.5880	22'44'5	1.1784	0.9911
55	74.57	6:4 5:2	150 112	.5969	22'34'66' ; 233'56 ; 23'44'6	0.1155	0.0971
56	74.70	5:2	083 109	.6029	22'33'5 ; 233'46	0.1866	0.1569
57	75.19	6:4 5:2	152 097	.6062	22'3566' ; 22'345 ; 22'3'45	0.4589	0.3838
58	75.5	5:2	087 111	.6175	22'345' ; 233'55' ; 2344'6	0.3644	0.3065
59	75.84	5:2	085 116	.6224	22'344' ; 234567	0.2644	0.2223
60	76.13	6:4	136	.6257	22'33'66'	0.0000	0.0000
61	76.28	4:0 5:2	077 110	.6295	33'44' ; 233'4'6	2.2718	1.9106
62	76.72	6:3	154	.6349	22'44'56'	0.0419	0.0319
63	77.03	5:2	082	.6453	22'33'4	0.1346	0.1132
64	77.49	6:3	151	.6499	22'355'6	0.2405	0.1830
65	77.78	6:3 5:1	135 124	.6563	22'33'56' ; 2'344'5	0.2376	0.2017
66	77.9	6:3	144	.6584	22'345'6	0.0000	0.0000
67	78.01	5:1 6:3	107 108	.6628	233'4'5 ; 233'45' ; 22'34'56	0.2126	0.1733
68	78.25	5:1	123	.6658	2'344'5	0.0000	0.0000
69	78.37	6:3 5:1	149 118	.6672	22'34'5'6 ; 23'44'5 ; 233'45	2.3795	1.8632
70	78.55	6:3	139 140	.6707	22'344'6 ; 22'344'6'	0.0000	0.0000
71	79.15	6:3 5:1	134 143	.6796	22'33'56' ; 22'3456'; 2344'5	0.1630	0.1349
72	79.53	5:1 6:3	122 131	.6871	2'33'45; 22'33'46;22'34'55'+	0.0000	0.0000
73	79.95	6:2	146 161	.6955	22'34'55' ; 233'45'6	0.1993	0.1516
74	80.31	6:3 5:1	132 105	.7035	22'33'46' ; 233'44'	0.3761	0.3130
75	80.47	6:2	153	.7036	22'44'55'	1.9314	1.4690
76	81.27	6:2	168	.7068	23'44'5'6	0.0373	0.0284
77	81.48	6:2	141	.7203	22'3455'	0.1421	0.1081
78	81.66	7:4	179	.7205	22'33'566'	0.0704	0.0489
79	82.02	6:2	130	.7204	22'33'45'	0.1404	0.1068
80	82.15	6:2	137	.7329	22'344'5	0.1329	0.1011
81	82.35	7:4	176	.7305	22'33'466'	0.0000	0.0000
82	82.69	6:2	138 163	.7403	22'344'5' ; 233'4'56 ; +2	0.9945	0.7565
83	83.06	6:2	158	.7429	233'44'6	0.2030	0.1544
84	83.44	6:2	129	.7501	22'33'45	0.1207	0.0918
85	83.93	7:3	178	.7537	22'33'55'6	0.0243	0.0169
86	84.14	6:2	166	.7572	2344'56	0.0064	0.0049
87	84.4	7:3	175	.7611	22'33'45'6	0.0000	0.0000
88	84.71	7:3	187 182	.7658	22'34'55'6 ; 22'344'56'	0.1333	0.0926
89	85.1	6:2	128	.7761	22'33'44'	0.2630	0.2001
90	85.4	7:3	183	.7720	22'344'5'6	0.0000	0.0000
91	85.72	6:1	167	.7814	23'44'55'	0.1614	0.1227
92	86.34	7:3	185	.7840	22'3455'6	0.0165	0.0115
93	86.99	7:3	174 181	.7965	22'33'456' ; 22'344'56	0.1109	0.0772
94	87.45	7:3	177	.8031	22'33'4'56	0.0811	0.0565
95	87.97	7:3 6:1	171 156	.8105	22'33'44'6 ; 233'44'5	0.2255	0.1667
96	88.44	8:4	202	.8089	22'33'55'66'	0.0269	0.0172
97	88.55	6:1	157	.8184	233'44'5'	0.0000	0.0000
98	88.91	7:3	173	.8152	22'33'456	0.0000	0.0000
99	89.36	8:4	200 204	.8197	22'33'45'66' ; 22'344'566'	0.0000	0.0000
100	89.57	7:2	172 192	.8278	22'33'455' ; 233'455'6	0.0456	0.0317
101	90.2	8:4	197	.8293	22'33'44'66'	0.0000	0.0000
102	90.4	7:2	180	.8362	22'344'55'	0.2456	0.1705
103	90.79	7:2	193	.8397	233'4'55'6	0.0079	0.0055
104	91.44	7:2	191	.8447	233'44'5'6	0.0000	0.0000
105	92.13	8:4	199	.8494	22'33'4566'	0.0116	0.0074
106	93.8	7:2	170	.8748	22'33'44'5	0.1425	0.0990
107	94.44	7:2	190	.8748	233'44'56	0.0000	0.0000
108	95.8	8:3	198	.8849	22'33'455'6	0.0293	0.0187
109	95.99	8:3	201	.8875	22'33'4'55'6	0.0000	0.0000
110	96.85	8:3	196 203	.8935	22'33'44'5'6 ; 22'344'55'6	0.0000	0.0000
111	98.72	7:1	189	.9142	233'44'55'	0.0000	0.0000
112	101	8:3	195	.9321	22'33'44'56	0.0133	0.0085
113	101.87	9:4	208	.9320	22'33'455'66'	0.0000	0.0000
114	103.29	9:4	207	.9423	22'33'44'566'	0.0000	0.0000
115	105.2	8:2	194	.9628	22'33'44'55'	0.0411	0.0263
116	106.77	8:2	205	.9670	233'44'55'6	0.0000	0.0000
117	114.24	9:3	206	1.018	22'33'44'55'6	0.0000	0.0000
118	126.35	10:4	209	1.058	22'33'44'55'66'	0.0000	0.0000

CONCENTRATION = 3.023534
TOTAL MICROMOLES = 0.0110

[illegible] MOLECULAR WEIGHT = 276.50688

N. B.
9 A



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RI32:NB9A.RES

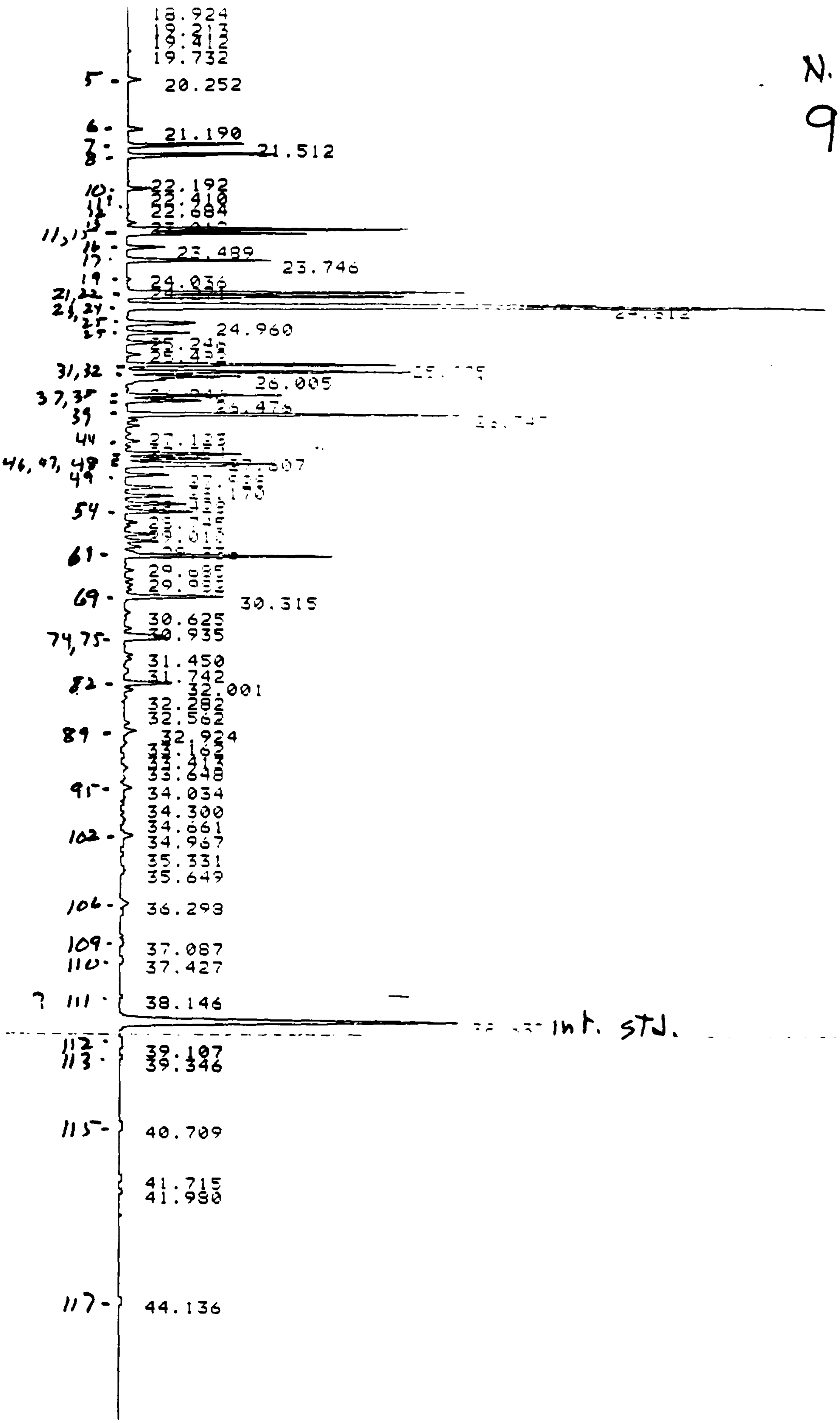
N.B. 9A

PEAKS	RLT. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.61	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.72	1:1	001	.1544	2	0.0000	0.0000
3	50.08	1:0	002	.1937	3	1.3630	1.9190
4	50.62	1:0	003	.1975	4	0.6300	0.8870
5	52.33	2:2	004 010	.2245	22' : 26	3.7098	4.4166
6	54.73	2:1	007 009	.2566	24 : 25	1.0615	1.2640
7	55,59	2:1	006	.2709	23'	2.6335	3.1360
8	56.1	2:1	005 008	.2785	23 : 24'	6.3036	7.5064
9	57.4	2:0	014	.2973	35	0.0761	0.0906
10	57.73	3:3	019	.3045	22'6	1.1025	1.1375
11	58.61	2:2	030	.3165	246	0.0396	0.0408
12	59.16	2:0	011	.3238	33'	0.1032	0.1229
13	59.47	2:0	012 013	.3297	34 : 34'	0.2691	0.3205
14	59.8	3:2 2:0	018 015	.3387	22'5 : 44'	10.6706	11.4687
15	60.01	3:2	017	.3390	22'4	5.4099	5.5015
16	60.71	3:2	024 027	.3500	236 : 23'6	0.0620	0.0893
17	61.30	3:2	016 032	.3625	22'3 : 24'6	3.1957	3.2970
18	62.1	3:1	023	.3770	235	0.0093	0.0096
19	62.51	3:1 4:4	034 054	.3800	2'35 : 22'66'	0.0712	0.0707
20	62.72	3:1	029	.3820	245	0.0731	0.0755
21	62.90	3:1	026	.3911	23'5	1.0321	1.0902
22	63.19	3:1	025	.3937	23'4	1.4760	1.5228
23	63.6	3:1	031	.4024	24'5	7.1224	7.3483
24	63.73	3:1 4:3	028 050	.4031	244' : 22'46	0.0730	9.1300
25	64.51	3:1 4:3	021 033	.4170	233' : 234 : 22'56'	3.4115	3.1790
26	65	3:1 4:3	022 051	.4267	234' : 22'46'	1.4064	1.3772
27	65.49	4:3	045	.4334	22'36	0.9739	0.8861
28	65.88	3:1	036	.4379	33'5	0.0472	0.0487
29	66.09	4:3	046	.4450	22'36'	0.6307	0.5739
30	66.45	3:1	039	.4488	34'5	0.0000	0.0000
31	66.6	4:2	052 073	.4554	22'55' : 23'5'6	4.6361	4.2100
32	66.97	4:2	049	.4610	22'45	3.6524	3.3230
33	67.23	4:2	047	.4639	22'44'	1.6140	1.4684
34	67.35	4:2	048 075	.4651	22'45 : 244'6	1.3541	1.2320
35	67.51	4:2	065 062	.4865	2346 : 2356	0.0838	0.0763
36	67.82	3:0	035	.4738	33'4	0.1489	0.1531
37	68.16	5:4 4:2	104 044	.4832	22'466' : 22'35'	2.5752	2.3402
38	68.44	3:0 4:2	037 042	.4870	344' : 22'34' : 233'6	2.5047	2.2978
39	69.14	4:2	064 071	.4990	23'34 : 234'6 : 23'4'6 +	2.9902	2.7206
40	69.25	4:1	068	.5040	23'45' 7	0.0000	0.0000
41	69.4	5:4	096	.5057	22'366'	0.1831	0.1490
42	69.68	4:2	040	.5102	22'33'	0.5225	0.4754
43	70.1	5:3 4:1	103 057	.5155	22'45'6 : 233'5	0.0923	0.0820
44	70.46	5:3 4:1	100 067	.5212	22'44'6 : 23'4'5	0.2500	0.2192
45	70.79	4:1	058 063	.5267	233'5' : 234'5	0.1178	0.1072
46	71.13	4:1 5:3	074 094	.5340	244'5 : 22'356'	1.0203	0.8737
47	71.36	4:1	070 061	.5407	23'4'5 : 2'345 : 23457	1.6800	1.5292
48	71.6	4:1 5:3	066 095	.5447	23'44' : 22'356 : 22'35'6	2.5554	2.0903
49	72.19	5:3 4:1	091 098	.5549	22'34'6 : 22'3'46 : 233'4	0.5012	0.4122
50	72.81	4:1	056 060	.5676	233'4' : 2344'	0.9938	0.9035
51	73.25	6:4 5:3	155 084	.5666	22'44'66' : 22'33'6: 22'355'	0.5420	0.4394
52	73.49	5:3	089	.5779	22'346'	0.0000	0.0000
53	73.67	5:2	101 090	.5814	22'34'5 : 22'455'	1.1046	0.8991
54	74.05	5:2	099	.5880	22'44'5	0.8522	0.6936
55	74.6	6:4 5:2	150 112	.5969	22'34'66' : 233'56 : 23'44'6	0.0083	0.0694
56	74.8	5:2	083 109	.6029	22'33'5 : 233'46	0.1264	0.1029
57	75.22	6:4 5:2	152 097	.6062	22'3566' : 22'345 : 22'3'45	0.3667	0.2968
58	75.53	5:2	087 111	.6175	22'345' : 233'55' : 2344'6	0.2074	0.2339
59	75.84	5:2	085 116	.6224	22'344' : 234567	0.1900	0.1546
60	76.13	6:4	136	.6257	22'33'66'	0.0000	0.0000
61	76.28	4:0 5:2	077 110	.6295	33'44' : 233'4'6	1.2809	1.0426
62	76.72	6:3	154	.6349	22'44'56'	0.0296	0.0218
63	77.03	5:2	082	.6453	22'33'4	0.1192	0.0970
64	77.49	6:3	151	.6499	22'355'6	0.1296	0.0954
65	77.70	6:3 5:1	135 124	.6563	22'33'56' : 2'344'5	0.1455	0.1102
66	77.9	6:3	144	.6584	22'345'6	0.0000	0.0000
67	77.99	5:1 6:3	107 108	.6628	233'4'5 : 233'45' : 22'34'56	0.1419	0.1119
68	78.25	5:1	123	.6650	2'344'5	0.0000	0.0000
69	78.37	6:3 5:1	149 118	.6672	22'34'5'6 : 23'44'5 : 233'45	1.4057	1.0652
70	78.55	6:3	139 140	.6707	22'344'6 : 22'344'6'	0.0000	0.0000
71	79.18	6:3 5:1	134 143	.6796	22'33'56' : 22'3456'; 2344'5	0.0925	0.0737
72	79.41	5:1 6:3	122 131	.6871	2'33'45; 22'33'46;22'33'55'4	0.0390	0.0309
73	79.95	6:2	146 161	.6955	22'34'55' : 233'45'6	0.1230	0.0911
74	80.3	6:3 5:1	132 105	.7035	22'33'46' : 233'44'	0.2589	0.2085
75	80.52	6:2	153	.7036	22'44'55'	0.0000	0.0000
76	81.3	6:2	168	.7068	23'44'5'6	0.0844	0.0621
77	81.5	6:2	141	.7203	22'3455'	0.0684	0.0504
78	81.8	7:4	179	.7205	22'33'566'	0.0145	0.0097
79	82	6:2	130	.7284	22'33'45'	0.0673	0.0495
80	82.2	6:2	137	.7329	22'344'5	0.0000	0.0000
81	82.35	7:4	176	.7305	22'33'466'	0.0000	0.0000
82	82.7	6:2	138 163	.7403	22'344'5' : 233'4'56 : +2	0.5495	0.4045
83	83	6:2	158	.7429	233'44'6	0.1075	0.0791
84	83.4	6:2	129	.7501	22'33'45	0.0633	0.0466
85	83.9	7:3	178	.7537	22'33'55'6	0.0229	0.0154
86	84.25	6:2	166	.7572	2344'56	0.0000	0.0000
87	84.4	7:3	175	.7611	22'33'45'6	0.0000	0.0000
88	84.7	7:3	187 182	.7654	22'34'55'6 : 22'344'56'	0.0634	0.0426
89	85.1	6:2	128	.7761	22'33'44'	0.1365	0.1005
90	85.4	7:3	183	.7720	22'344'5'6	0.0000	0.0000
91	85.7	6:1	167	.7814	23'44'55'	0.0951	0.0700
92	86.6	7:3	185	.7840	22'3455'6	0.0062	0.0042
93	86.9	7:3	174 181	.7965	22'33'456' : 22'344'56	0.0458	0.0309
94	87.4	7:3	177	.8031	22'33'4'56	0.0359	0.0242
95	87.9	7:3 6:1	171 156	.8105	22'33'44'6 : 233'44'5	0.1273	0.0911
96	88.4	8:4	202	.8089	22'33'55'66'	0.0174	0.0107
97	88.55	6:1	157	.8184	233'44'5'	0.0000	0.0000
98	88.91	7:3	173	.8152	22'33'456	0.0000	0.0000
99	89.5	8:4	208 204	.8197	22'33'45'66' : 22'344'566'	0.0293	0.0181
100	89.68	7:2	172 192	.8270	22'33'455' : 233'455'6	0.0000	0.0000
101	90.2	8:4	197	.8293	22'33'44'66'	0.0000	0.0000
102	90.4	7:2	180	.8362	22'344'55'	0.1063	0.0714
103	90.91	7:2	193	.8397	233'4'55'6	0.0000	0.0000
104	91.3	7:2	191	.8447	233'44'5'6	0.0017	0.0012
105	92.1	8:4	199	.8494	22'33'4566'	0.0219	0.0136
106	93.8	7:2	170	.8740	22'33'44'5	0.0640	0.0436
107	94.3	7:2	190	.8748	233'44'56	0.0206	0.0139
108	95.8	8:3	198	.8845	22'33'455'6	0.0047	0.0029
109	96	8:3	201	.8875	22'33'4'55'6	0.0000	0.0000
110	96.7	8:3	196 203	.8935	22'33'44'5'6 : 22'344'55'6	0.0245	0.0151
111	98.6	7:1	189	.9142	233'44'55'	0.0033	0.0023
112	100.7	8:3	195	.9321	22'33'44'56	0.0000	0.0000
113	101.87	9:4	200	.9320	22'33'455'66'	0.0000	0.0000
114	103.29	9:4	207	.9423	22'33'44'566'	0.0000	0.0000
115	105.2	8:2	194	.9620	22'33'44'55'	0.0171	0.0106
116	106.77	8:2	205	.9678	233'44'55'6	0.0000	0.0000
117	114.1	9:3	206	1.010	22'33'44'55'6	0.0313	0.0179
118	126.35	10:4	209	1.050	22'33'44'55'66'	0.0000	0.0000

CONCENTRATION = 2.060414
TOTAL MICROMOLES = 0.0070

AVERAGE MOLECULAR WEIGHT = 265.46769

N. B.
9 B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NT32:NU98.RES

N.B 9B

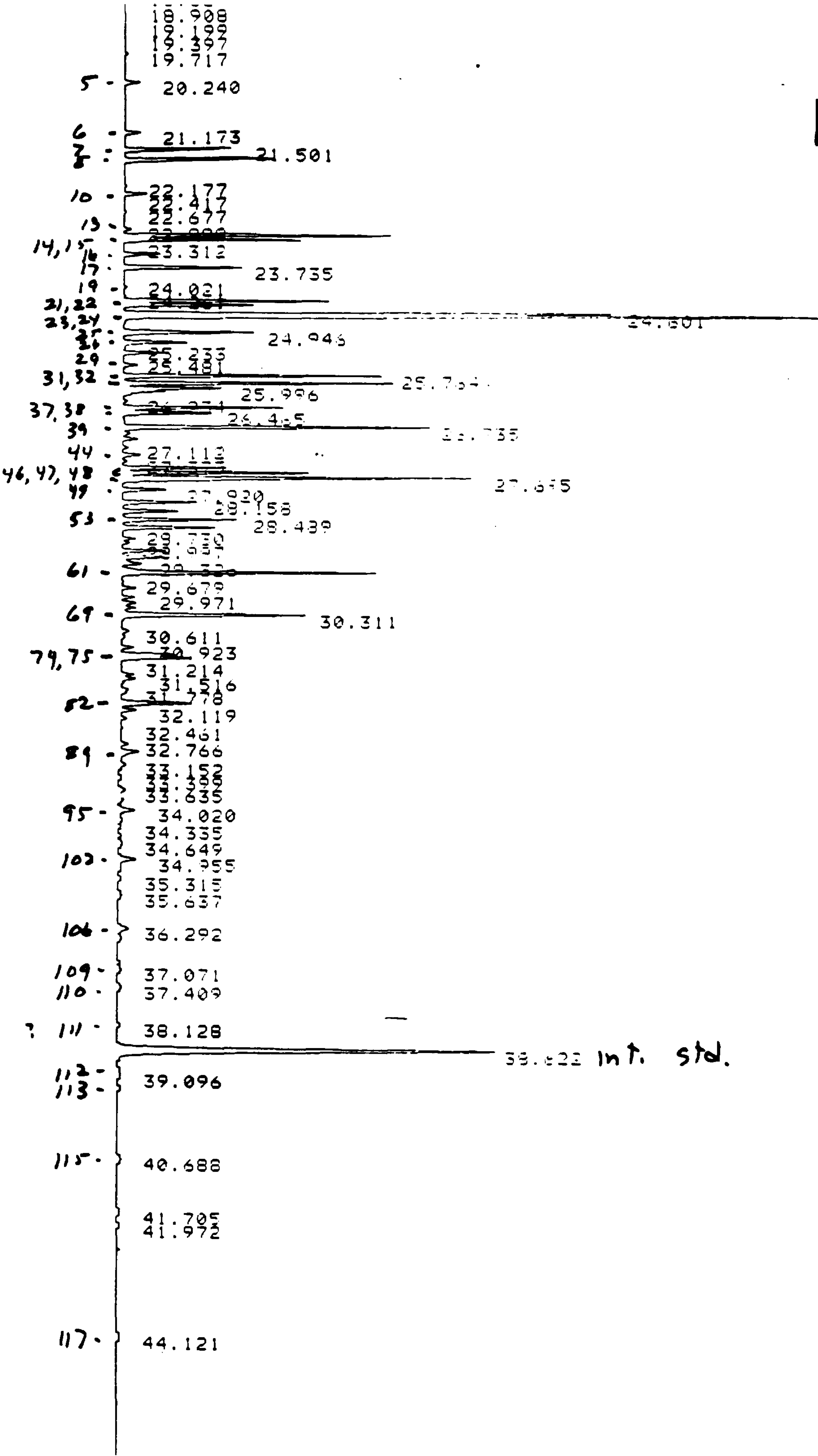
PEAK#	RET. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.63	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.72	1:1	001	.1544	2	0.0000	0.0000
3	50.29	1:0	002	.1937	3	0.0000	0.0000
4	50.61	1:0	003	.1975	4	0.1944 ?	0.2767
5	52.34	2:2	004 010	.2245	22' + 26	2.5912	3.1193
6	54.75	2:1	007 009	.2564	24 + 25	0.6003	0.8109
7	55.6	2:1	006	.2709	23'	4.0734	4.9035
8	56.09	2:1	005 008	.2785	23 + 24'	4.0020	5.7806
9	57.35	2:0	014	.2973	35	0.0141	0.0169
10	57.75	3:3	019	.3045	22'6	0.9355	0.9757
11	58.6	3:2	030	.3165	246	0.0314	0.0327
12	59.17	2:0	011	.3238	33'	0.0956	0.1151
13	59.40	2:0	012 013	.3297	34 + 34'	0.5662	0.6816
14	59.81	3:2 2:0	018 015	.3387	22'5 + 44'	10.2050	11.1757
15	60.02	3:2	017	.3398	22'4	5.3183	5.5468
16	60.49	3:2	024 027	.3508	236 + 23'6	0.7505	0.7828
17	61.37	3:2	016 032	.3625	22'3 + 24'6	2.4292	2.5335
18	62.12	3:1	023	.3770	235	0.0086	0.0089
19	62.32	3:1 4:4	034 054	.3808	2'35 + 22'66'	0.1036	0.1039
20	62.74	3:1	029	.3828	245	0.0271	0.0282
21	62.99	3:1	026	.3911	23'5	4.7583	4.9627
22	63.18	3:1	025	.3937	23'4	4.6048	4.8027
23	63.62	3:1	031	.4024	24'5	7.3051	7.6198
24	63.72	3:1 4:3	028 050	.4031	244' + 22'46	8.7206	9.0794
25	64.49	3:1 4:3	021 033	.4170	233' + 234 + 22'56'	1.6258	1.5315
26	65.01	3:1 4:3	022 051	.4267	234' + 22'46'	0.6868	0.6799
27	65.48	4:3	045	.4334	22'36	0.7989	0.7274
28	65.84	3:1	036	.4379	33'5	0.0000	0.0000
29	66.07	4:3	046	.4450	22'36'	0.5365	0.4935
30	66.45	3:1	039	.4488	34'5	0.0000	0.0000
31	66.61	4:2	052 073	.4554	22'55' + 23'5'6	6.0980	5.6086
32	66.98	4:2	049	.4610	22'45	4.5941	4.2254
33	67.21	4:2	047	.4639	22'44'	1.8976	1.7453
34	67.36	4:2	048 075	.4651	22'45 + 244'6	0.7947	0.7309
35	67.6	4:2	065 062	.4665	2346 + 2356	0.0000	0.0000
36	67.83	3:0	035	.4738	33'4	0.0002	0.0036
37	68.14	5:4 4:2	104 044	.4832	22'466' + 22'35'	2.0577	1.8965
38	68.43	3:0 4:2	037 042	.4870	344' + 22'34' + 234'6	1.7847	1.6551
39	69.12	4:2	064 071	.4990	23'34 + 234'6 + 23'4'6 +	3.2115	2.9538
40	69.25	4:1	068	.5040	23'45' ?	0.0000	0.0000
41	69.38	5:4	096	.5057	22'366'	0.3489	0.2871
42	69.67	4:2	040	.5102	22'33'	0.2324	0.2137
43	70.08	5:3 4:1	103 057	.5155	22'45'6 + 233'5	0.0997	0.0896
44	70.44	5:3 4:1	100 067	.5212	22'44'6 + 23'45	0.2822	0.2424
45	70.78	4:1	058 063	.5267	233'5' + 234'5	0.0770	0.0708
46	71.11	4:1 5:3	074 094	.5340	244'5 + 22'356'	1.3660	1.1732
47	71.35	4:1	070 061	.5407	23'4'5 + 2'345 + 23457	1.0800	1.0087
48	71.61	4:1 5:3	066 095	.5447	23'44' + 22'356 + 22'35'6	1.7325	1.4326
49	72.17	5:3 4:1	091 098	.5549	22'34'6 + 22'3'46 + 233'4	0.7050	0.5867
50	72.8	4:1	056 060	.5676	233'4' + 2344'	0.6194	0.5697
51	73.24	6:4 5:3	155 084	.5666	22'44'66' + 22'33'6: 22'355'	0.6991	0.5720
52	73.49	5:3	089	.5779	22'346'	0.0000	0.0000
53	73.65	5:2	101 090	.5814	22'34'5 + 22'455'	0.9279	0.7635
54	74.06	5:2	099	.5888	22'44'5	1.0320	0.8492
55	74.58	6:4 5:2	150 112	.5969	22'34'66' + 233'56 + 23'44'6	0.1393	0.1146
56	74.79	5:2	083 109	.6029	22'33'5 + 233'46	0.1249	0.1027
57	75.17	6:4 5:2	152 097	.6062	22'3566' + 22'345 + 22'3'45	0.3575	0.2925
58	75.54	5:2	087 111	.6175	22'345' + 233'55' + 2344'6	0.2350	0.1941
59	75.82	5:2	085 116	.6224	22'344' + 23456?	0.1759	0.1447
60	76.13	6:4	136	.6257	22'33'66'	0.0000	0.0000
61	76.29	4:0 5:2	077 110	.6295	33'44' + 233'4'6	1.8993	1.5628
62	76.73	6:3	154	.6349	22'44'56'	0.0329	0.0245
63	77.01	5:2	082	.6453	22'33'4	0.0989	0.0814
64	77.5	6:3	151	.6499	22'355'6	0.1429	0.1063
65	77.76	6:3 5:1	135 124	.6548	22'33'56' + 2'344'5	0.1485	0.1130
66	77.9	6:3	144	.6584	22'345'6	0.0000	0.0000
67	77.99	5:1 6:3	107 108	.6620	233'4'5 + 233'45' + 22'34'56	0.1263	0.1007
68	78.25	5:1	123	.6650	2'344'5	0.0000	0.0000
69	78.36	6:3 5:1	149 118	.6672	22'34'5'6 + 23'44'5 + 233'45	1.3905	1.0652
70	78.56	6:3	139 140	.6707	22'344'6 + 22'344'6'	0.0134	0.0100
71	79.16	6:3 5:1	134 143	.6794	22'33'56' + 22'3456': 2344'5	0.0946	0.0762
72	79.44	5:1 6:3	122 131	.6871	2'33'45: 22'33'46: 22'33'55'+	0.0361	0.0285
73	79.96	6:2	146 161	.6955	22'34'55' + 233'45'6	0.1302	0.0969
74	80.32	6:3 5:1	132 105	.7035	22'33'46' + 233'44'	{ 0.2294	0.1867
75	80.45	6:2	153	.7036	22'44'55'	{ 1.1247	0.8369
76	81.20	6:2	168	.7066	23'44'5'6	0.0725	0.0540
77	81.40	6:2	141	.7203	22'3455'	0.0590	0.0439
78	81.67	7:4	179	.7205	22'33'566'	0.0402	0.0273
79	82.03	6:2	130	.7284	22'33'45'	0.0667	0.0496
80	82.18	6:2	137	.7329	22'344'5	0.0855	0.0636
81	82.35	7:4	176	.7305	22'33'466'	0.0000	0.0000
82	82.73	6:2	138 163	.7404	22'344'5' + 233'4'56 + +3	0.5310	0.3951
83	83.04	6:2	158	.7429	233'44'6	0.1120	0.0839
84	83.42	6:2	129	.7501	22'33'45	0.0541	0.0402
85	83.94	7:3	178	.7537	22'33'55'6	0.0127	0.0086
86	84.15	6:2	166	.7572	2344'56	0.0022	0.0017
87	84.4	7:3	175	.7611	22'33'45'6	0.0000	0.0000
88	84.72	7:3	187 182	.7633	22'34'55'6 + 22'344'56'	0.0770	0.0523
89	85.1	6:2	128	.7761	22'33'44'	0.1363	0.1014
90	85.4	7:3	183	.7720	22'344'5'6	0.0000	0.0000
91	85.73	6:1	167	.7814	23'44'55'	0.0880	0.0655
92	86.44	7:3	185	.7840	22'3455'6	0.0000	0.0000
93	86.97	7:3	174 181	.7965	22'33'456' + 22'344'56	0.0481	0.0327
94	87.46	7:3	177	.8031	22'33'4'56	0.0369	0.0251
95	87.98	7:3 6:1	171 156	.8105	22'33'44'6 + 233'44'5	0.1140	0.0830
96	88.47	8:4	202	.8089	22'33'55'66'	0.0161	0.0100
97	88.55	6:1	157	.8144	233'44'5'	0.0000	0.0000
98	88.91	7:3	173	.8152	22'33'456	0.0000	0.0000
99	89.36	8:4	200 204	.8197	22'33'45'66' + 22'344'566'	0.0000	0.0000
100	89.50	7:2	172 192	.8270	22'33'455' + 233'455'6	0.0257	0.0179
101	90.2	8:4	197	.8298	22'33'44'66'	0.0000	0.0000
102	90.41	7:2	180	.8342	22'344'55'	0.1152	0.0782
103	90.91	7:2	193	.8397	233'4'55'6	0.0000	0.0000
104	91.44	7:2	191	.8447	233'44'5'6	0.0000	0.0000
105	92.14	8:4	199	.8494	22'33'4566'	0.0102	0.0063
106	93.8	7:2	170	.8740	22'33'44'5	0.0689	0.0460
107	94.3	7:2	190	.8740	233'44'56	0.0164	0.0111
108	95.0	8:3	198	.8845	22'33'455'6	0.0131	0.0082
109	95.99	8:3	201	.8875	22'33'4'55'6	0.0000	0.0000
110	96.7	8:3	196 203	.8935	22'33'44'5'6 + 22'344'55'6	0.0227	0.0142
110	98.72	7:1	189	.9142	233'44'55'	0.0000	0.0000

CONCENTRATION = 2.776844
TOTAL MICROMOLES = 0.0108

AVERAGE MOLECULAR WEIGHT = 260.56470
NUMBER OF CALIBRATED PEAKS FOUND = 111

A-25

N.B.
12A



12A

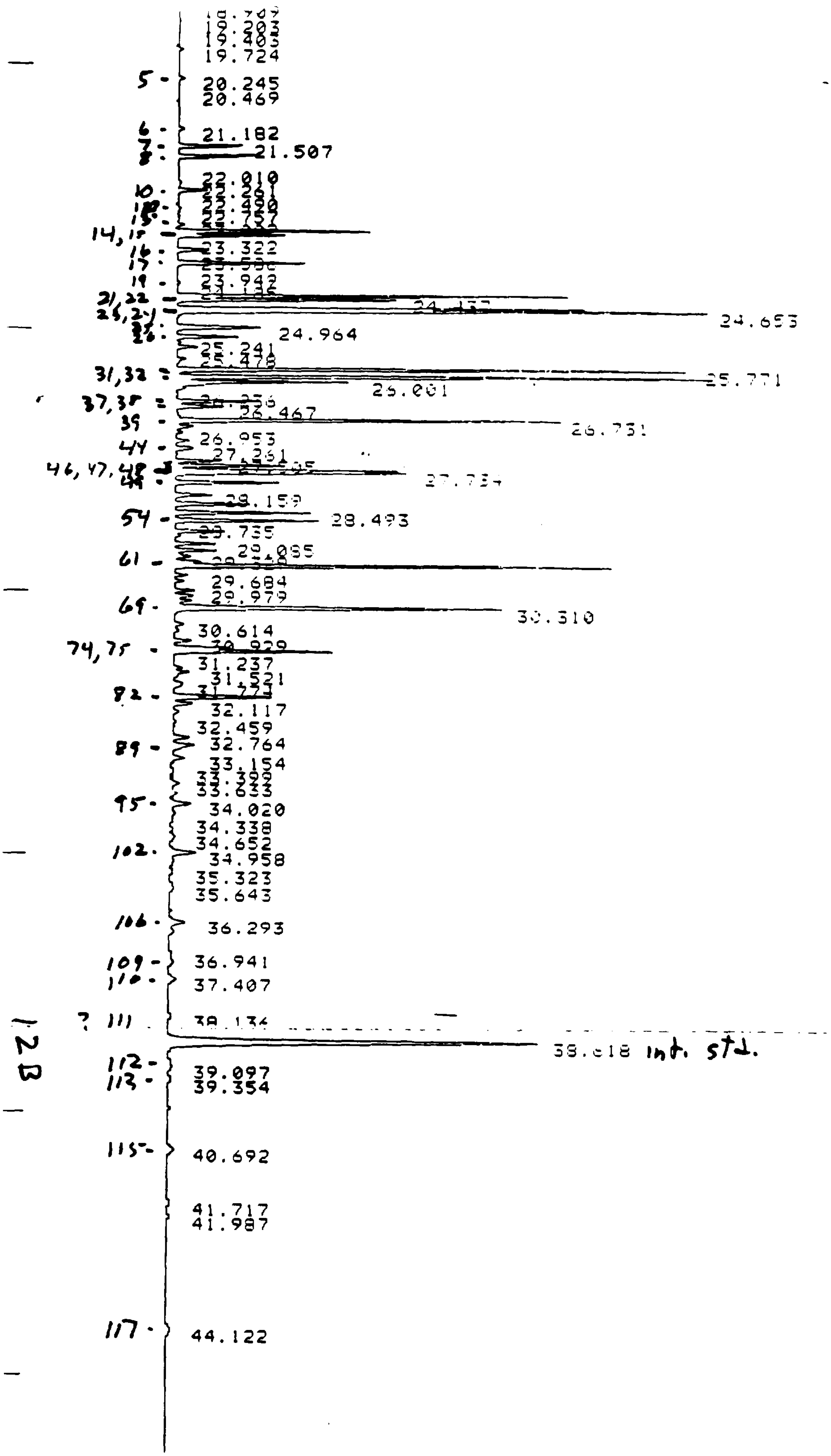
N.B. 12 A

PEAK#	RET. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.62	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.62	1:1	001	.1544	2	0.2693	0.3892
3	50.29	1:0	002	.1937	3	0.0000	0.0000
4	50.61	1:0	003	.1975	4	0.1817	0.2626
5	52.34	2:2	004 010	.2245	22' : 26	2.6644	3.2560
6	54.75	2:1	007 009	.2566	24 : 25	0.6218	0.7600
7	55.58	2:1	006	.2709	23'	3.5040	4.2840
8	56.09	2:1	005 008	.2785	23 : 24'	5.0601	6.1851
9	57.49	2:0	014	.2975	35	0.0000	0.0000
10	57.75	3:3	019	.3095	22'6	0.8904	0.9429
11	58.63	3:2	030	.3165	246	0.0293	0.0311
12	59.21	2:0	011	.3238	33'	0.0000	0.0000
13	59.46	2:0	012 013	.3297	34 : 34'	0.4446	0.5434
14	59.79	3:2 2:0	018 015	.3387	22'5 : 44'	9.5386	10.5234
15	60.08	3:2	017	.3398	22'4	4.9714	5.2649
16	60.7	3:2	024 027	.3508	236 : 23'6	0.7385	0.7821
17	61.37	3:2	016 032	.3625	22'3 : 24'6	2.2150	2.3457
18	62.1	3:1	023	.3770	235	0.0080	0.0085
19	62.45	3:1 4:4	034 054	.3800	2'35 : 22'66'	0.0000	0.0000
20	62.72	3:1	029	.3820	245	0.0190	0.0201
21	62.98	3:1	026	.3911	23'5	3.0359	3.2151
22	63.18	3:1	025	.3937	23'4	2.3004	2.4362
23	63.62	3:1	031	.4024	24'5	7.1387	7.5516
24	63.73	3:1 4:3	028 050	.4031	244' : 22'46	0.3519	0.3212
25	64.5	3:1 4:3	021 033	.4170	233' : 234 : 22'56'	2.3016	2.2014
26	64.99	3:1 4:3	022 051	.4267	234' : 22'46'	0.6920	0.6453
27	65.51	4:3	045	.4334	22'36	0.7393	0.6905
28	65.84	3:1	036	.4379	33'5	0.0000	0.0000
29	66.08	4:3	046	.4450	22'36'	0.5311	0.4960
30	66.45	3:1	039	.4480	34'5	0.0000	0.0000
31	66.62	4:2	052 073	.4554	22'55' : 23'5'6	5.1017	4.7645
32	66.99	4:2	049	.4610	22'45	4.0730	3.8038
33	67.22	4:2	047	.4639	22'44'	1.6746	1.5639
34	67.35	4:2	048 075	.4651	22'45 : 244'6	0.7199	0.6723
35	67.6	4:2	065 062	.4665	2346 : 2356	0.0000	0.0000
36	67.84	3:0	035	.4738	33'4	0.1285	0.1360
37	68.18	5:4 4:2	104 044	.4832	22'466' : 22'35'	2.0620	1.9235
38	68.45	3:0 4:2	037 042	.4870	344' : 22'34' : 234'6	2.0319	1.9134
39	69.13	4:2	064 071	.4990	23'34 : 234'6 : 23'4'6 +	2.7004	2.5967
40	69.25	4:1	068	.5040	23'45' ?	0.0000	0.0000
41	69.39	5:4	096	.5057	22'366'	0.2236	0.1868
42	69.68	4:2	040	.5102	22'33'	0.2407	0.2248
43	70.12	5:3 4:1	103 057	.5155	22'45'6 : 233'5	0.0998	0.0911
44	70.45	5:3 4:1	100 067	.5212	22'44'6 : 23'4'5	0.3505	0.3127
45	70.79	4:1	058 063	.5267	233'5' : 234'5	0.0780	0.0728
46	71.13	4:1 5:3	074 094	.5340	244'5 : 22'356'	1.1523	1.0049
47	71.36	4:1	070 061	.5407	23'4'5 : 2'345 : 23457	2.3608	2.2047
48	71.62	4:1 5:3	066 095	.5447	23'44' : 22'356 : 22'35'6	4.5069	3.7042
49	72.19	5:3 4:1	091 098	.5549	22'34'6 : 22'3'46 : 233'4	0.7391	0.6239
50	72.81	4:1	056 060	.5676	233'4' : 2344'	0.8409	0.7053
51	73.25	6:4 5:3	155 089	.5666	22'44'66' : 22'34'6: 22'355'	0.7607	0.6320
52	73.49	5:3	089	.5779	22'346'	0.0000	0.0000
53	73.66	5:2	101 090	.5814	22'34'5 : 22'455'	1.9414	1.2070
54	74.05	5:2	099	.5880	22'44'5	1.2273	1.0254
55	74.59	6:4 5:2	150 112	.5969	22'34'66' : 233'56 : 23'44'6	0.1345	0.1124
56	74.8	5:2	083 109	.6029	22'33'5 : 233'46	0.1459	0.1219
57	75.21	6:4 5:2	152 097	.6042	22'3566' : 22'345 : 22'3'45	0.4611	0.3831
58	75.52	5:2	087 111	.6175	22'345' : 233'55' : 2344'6	0.3250	0.2715
59	75.83	5:2	085 116	.6224	22'344' : 23456?	0.2114	0.1766
60	76.13	6:4	136	.6257	22'33'66'	0.0000	0.0000
61	76.3	4:0 5:2	077 110	.6295	33'44' : 233'4'6	2.2467	1.0771
62	76.74	6:3	154	.6349	22'44'56'	0.0410	0.0310
63	77.02	5:2	082	.6453	22'33'4	0.1280	0.1069
64	77.52	6:3	151	.6499	22'355'6	0.1768	0.1332
65	77.75	6:3 5:1	135 124	.6563	22'33'56' : 2'344'5	0.2003	0.1620
66	77.9	6:3	144	.6584	22'345'6	0.0000	0.0000
67	78.01	5:1 6:3	107 108	.6620	233'4'5 : 233'45' : 22'34'56	0.1842	0.1491
68	78.25	5:1	123	.6658	2'344'5	0.0000	0.0000
69	78.37	6:3 5:1	149 118	.6672	22'34'5'6 : 23'44'5 : 233'45	2.1902	1.7037
70	78.55	6:3	139 140	.6707	22'344'6 : 22'344'6'	0.0000	0.0000
71	79.17	6:3 5:1	134 143	.6796	22'33'56' : 22'3456': 2344'5	0.1264	0.1034
72	79.46	5:1 6:3	122 131	.6871	2'33'45: 22'33'46:22'34'55'+	0.0506	0.0405
73	79.97	6:2	146 161	.6955	22'34'55' : 233'45'6	0.1607	0.1214
74	80.34	6:3 5:1	132 105	.7035	22'33'46' : 233'44'	0.3063	0.2532
75	80.49	6:2	153	.7036	22'44'55'	1.6060	1.2135
76	81.29	6:2	168	.7068	23'44'5'6	0.0939	0.0709
77	81.5	6:2	141	.7203	22'3455'	0.0939	0.0710
78	81.7	7:4	179	.7205	22'33'566'	0.0000	0.0000
79	82.04	6:2	130	.7204	22'33'45'	0.1039	0.0785
80	82.17	6:2	137	.7129	22'344'5	0.0949	0.0717
81	82.35	7:4	176	.7305	22'33'466'	0.0000	0.0000
82	82.74	6:2	138 163	.7403	22'344'5' : 233'4'56 : +2	0.7312	0.5525
83	83.05	6:2	158	.7429	233'44'6	0.1519	0.1148
84	83.47	6:2	129	.7501	22'33'45	0.0842	0.0636
85	84	7:3	178	.7537	22'33'55'6	0.0000	0.0000
86	84.17	6:2	166	.7572	2344'56	0.0042	0.0032
87	84.4	7:3	175	.7611	22'33'45'6	0.0000	0.0000
88	84.78	7:3	187 182	.7653	22'34'55'6 : 22'344'56'	0.0891	0.0615
89	85.1	6:2	128	.7761	22'33'44'	0.1829	0.1382
90	85.4	7:3	183	.7720	22'344'5'6	0.0000	0.0000
91	85.74	6:1	167	.7814	23'44'55'	0.1303	0.0984
92	86.36	7:3	185	.7848	22'3455'6	0.0053	0.0037
93	86.99	7:3	174 181	.7965	22'33'456' : 22'344'56	0.0555	0.0384
94	87.45	7:3	177	.8031	22'33'4'56	0.0414	0.0286
95	87.99	7:3 6:1	171 156	.8105	22'33'44'6 : 233'44'5	0.1629	0.1193
96	88.46	8:4	202	.8089	22'33'55'66'	0.0207	0.0131
97	88.55	6:1	157	.8184	233'44'5'	0.0000	0.0000
98	88.91	7:3	173	.8152	22'33'456	0.0000	0.0000
99	89.36	8:4	200 204	.8197	22'33'45'66' : 22'344'566'	0.0000	0.0000
100	89.6	7:2	172 192	.8270	22'33'455' : 233'455'6	0.0308	0.0213
101	90.2	8:4	197	.8293	22'33'44'66'	0.0000	0.0000
102	90.4	7:2	180	.8362	22'344'55'	0.1413	0.0975
103	90.79	7:2	193	.8397	233'4'55'6	0.0031	0.0021
104	91.44	7:2	191	.8447	233'44'5'6	0.0000	0.0000
105	92.16	8:4	199	.8494	22'33'4566'	0.0114	0.0072
106	93.87	7:2	170	.8740	22'33'44'5	0.0873	0.0602
107	94.31	7:2	190	.8740	233'44'56	0.0255	0.0176
108	95.63	8:3	198	.8845	22'33'455'6	0.0000	0.0000
109	95.86	8:3	201	.8875	22'33'4'55'6	0.0198	0.0126
110	96.74	8:3	196 203	.8935	22'33'44'5'6 : 22'344'55'6	0.0259	0.0164
111	98.72	7:1	189	.9142	233'44'55'	0.0000	0.0000
112	101.23	8:3	195	.9321	22'33'44'56	0.0000	0.0000
113	101.87	9:4	208	.9320	22'33'455'66'	0.0000	0.0000
114	103.29	9:4	207	.9423	22'33'44'566'	0.0000	0.0000
115	105.2	8:2	194	.9620	22'33'44'55'	0.0148	0.0094
116	106.77	8:2	205	.9678	233'44'55'6	0.0000	0.0000
117	114.24	9:3	206	1.018	22'33'44'55'6	0.0000	0.0000
118	126.35	10:4	209	1.050	22'33'44'55'66'	0.0000	0.0000

CONCENTRATION = 2.060115
TOTAL MICROMOLES = 0.0105

AVERAGE MOLECULAR WEIGHT = 272.69987
NUMBER OF CALIBRATED PEAKS FOUND = 118

N. B.
12B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74,75
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12B

MT32:NB12B.RES

NB 12B

PEAK#	RLT. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.64	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.72	1:1	001	.1544	2	0.0000	0.0000
3	50.29	1:0	002	.1937	3	0.0000	0.0000
4	50.63	1:0	003	.1975	4	0.3959 ?	0.5936
5	52.37	2:2	004 010	.2245	22' ; 26	1.0555	1.3384
6	54.8	2:1	007 009	.2566	24 ; 25	0.2566	0.3253
7	55.63	2:1	006	.2709	23'	2.0845	2.6432
8	56.12	2:1	005 008	.2785	23 ; 24'	2.4006 ?	3.0441
9	57.39	2:0	014	.2973	35	0.1816 ?	0.2303
10	57.8	3:3	019	.3045	22'6	1.2009	1.3194
11	58.60	3:2	030	.3165	246	0.0497	0.0546
12	59.2	2:0	011	.3238	33'	0.7136 —	0.9049 —
13	59.51	2:0	012 013	.3297	34 ; 34'	0.4305	0.5459
14	59.85	3:2 2:0	018 015	.3387	22'5 ; 44'	6.6836	7.6496
15	60.06	3:2	017	.3398	22'4	3.2340	3.5540
16	60.76	3:2	024 027	.3508	236 ; 23'6	0.6650	0.7307
17	61.4	3:2	016 032	.3625	22'3 ; 24'6	2.0538	2.2564
18	62.15	3:1	023	.3770	235	0.0058	0.0064
19	62.36	3:1 4:4	034 054	.3800	2'35 ; 22'66'	0.0767	0.0810
20	62.70	3:1	029	.3820	245	0.0000	0.0000
21	63.03	3:1	026	.3911	23'5	5.2207	5.7358
22	63.22	3:1	025	.3937	23'4	3.2748	3.5979
23	63.66	3:1	031	.4024	24'5	5.1563	5.6650
24	63.78	3:1 4:3	028 050	.4031	244' ; 22'46	5.2790	5.7845
25	64.59	3:1 4:3	021 053	.4170	233' ; 234 ; 22'56'	1.6806	1.6677
26	65.03	3:1 4:3	022 051	.4267	234' ; 22'46'	0.5978	0.6234
27	65.54	4:3	045	.4334	22'36	0.4099	0.3972
28	65.84	3:1	036	.4379	33'5	0.0000	0.0000
29	66.11	4:3	046	.4450	22'36'	0.3964	0.3840
30	66.45	3:1	039	.4480	34'5	0.0000	0.0000
31	66.60	4:2	052 073	.4554	22'55' ; 23'5'6	10.0901	9.7759
32	67.02	4:2	049	.4618	22'45	7.9677	7.7196
33	67.20	4:2	047	.4634	22'44'	2.8265	2.7385
34	67.41	4:2	048 075	.4651	22'45 ; 244'6	0.0000	0.0000
35	67.56	4:2	065 062	.4665	2346 ; 2356	0.0849	0.0822
36	67.87	3:0	035	.4738	33'4	0.0777	0.0654
37	68.21	5:4 4:2	104 044	.4832	22'466' ; 22'35'	1.0910	1.0558
38	68.47	3:0 4:2	037 042	.4670	344' ; 22'34' ; 235'6	0.9734	0.9518
39	69.14	4:2	064 071	.4990	23'34 ; 234'6 ; 23'4'6 +	3.1172	3.0201
40	69.25	4:1	068	.5040	23'45' 7	0.0000	0.0000
41	69.45	5:4	096	.5057	22'366'	0.5278	0.4575
42	69.74	4:2	040	.5102	22'33'	0.1194	0.1157
43	70.15	5:3 4:1	103 057	.5155	22'45'6 ; 233'5	0.2562	0.2425
44	70.54	5:3 4:1	100 067	.5212	22'44'6 ; 23'4'5	0.4274	0.3867
45	70.85	4:1	058 063	.5267	233'5' ; 234'5	0.0348	0.0338
46	71.16	4:1 5:3	074 094	.5340	244'5 ; 22'356'	0.4782	0.4326
47	71.42	4:1	070 061	.5407	23'4'5 : 2'345 ; 2345?	1.3089	1.2681
48	71.65	4:1 5:3	066 095	.5447	23'44' ; 22'356 ; 22'35'6	2.3458	2.0434
49	72.22	5:3 4:1	091 098	.5549	22'34'6 ; 22'3'46 ; 233'4	1.5402	1.3550
50	72.84	4:1	056 060	.5676	233'4' ; 2344'	0.4672	0.4526
51	73.31	6:4 5:3	155 084	.5666	22'44'66' ; 22'33'6; 22'355'	0.9789	0.8437
52	73.49	5:3	089	.5779	22'346'	0.0000	0.0000
53	73.73	5:2	101 090	.5814	22'34'5 ; 22'455'	1.7053	1.4781
54	74.09	5:2	099	.5880	22'44'5	1.7791	1.5420
55	74.63	6:4 5:2	150 112	.5969	22'34'66' ; 233'56 ; 23'44'6	0.5358	0.4644
56	74.84	5:2	083 109	.6029	22'33'5 ; 233'46	0.1218	0.1056
57	75.25	6:4 5:2	152 097	.6062	22'3566' ; 22'345 ; 22'3'45	0.4332	0.3734
58	75.59	5:2	087 111	.6175	22'345' ; 233'55' ; 2344'6	0.3038	0.2633
59	75.87	5:2	085 116	.6224	22'344' ; 23456?	0.1706	0.1478
60	76.13	6:4	136	.6257	22'33'66'	0.4599	0.3605
61	76.37	4:0 5:2	077 110	.6295	33'44' ; 233'4'6	3.3959	2.9434
62	76.81	6:3	154	.6349	22'44'56'	0.1749	0.1371
63	77.09	5:2	082	.6456	22'33'4	0.0956	0.0828
64	77.56	6:3	151	.6499	22'355'6	0.2794	0.2190
65	77.82	6:3 5:1	135 124	.6563	22'33'56' ; 2'344'5	0.2868	0.2314
66	77.9	6:3	144	.6584	22'345'6	0.0000	0.0000
67	78.07	5:1 6:3	107 108	.6620	233'4'5 ; 233'45' ; 22'34'56	0.2538	0.2132
68	78.25	5:1	123	.6658	2'344'5	0.0000	0.0000
69	78.44	6:3 5:1	149 118	.6672	22'34'5'6 ; 23'44'5 ; 233'45	3.0944	3.1426
70	78.55	6:3	139 140	.6707	22'344'6 ; 22'344'6'	0.0000	0.0000
71	79.21	6:3 5:1	134 143	.6796	22'33'56' ; 22'3456'; 2344'5	0.1529	0.1298
72	79.52	5:1 6:3	122 131	.6871	2'33'45; 22'33'46;22'34'55'+	0.0684	0.0578
73	80.02	6:2	146 161	.6959	22'34'55' ; 233'45'6	0.2475	0.1940
74	80.4	6:3 5:1	132 105	.7035	22'33'46' ; 233'44'	0.2836	0.2432
75	80.56	6:2	153	.7036	22'44'55'	3.3127	2.5968
76	81.36	6:2	168	.7060	23'44'5'6	0.0739	0.0579
77	81.57	6:2	141	.7203	22'3455'	0.0994	0.0779
78	81.75	7:4	179	.7205	22'33'566'	0.0954	0.0683
79	82.11	6:2	130	.7204	22'33'45'	0.1298	0.1018
80	82.22	6:2	137	.7329	22'344'5	0.1451	0.1138
81	82.35	7:4	176	.7305	22'33'466'	0.0000	0.0000
82	82.79	6:2	138 163	.7403	22'344'5' ; 233'4'56 ; +2	1.0059	0.7885
83	83.1	6:2	158	.7429	233'44'6	0.2049	0.1606
84	83.51	6:2	129	.7501	22'33'45	0.0979	0.0767
85	84	7:3	178	.7537	22'33'55'6	0.0460	0.0329
86	84.29	6:2	166	.7572	2344'56	0.0092	0.0072
87	84.52	7:3	175	.7611	22'33'45'6	0.0083	0.0060
88	84.78	7:3	187 182	.7656	22'34'55'6 ; 22'344'56'	0.2141	0.1532
89	85.17	6:2	128	.7761	22'33'44'	0.2354	0.1846
90	85.4	7:3	183	.7724	22'344'5'6	0.0000	0.0000
91	85.79	6:1	167	.7819	23'44'55'	0.2988	0.2342
92	86.44	7:3	185	.7848	22'3455'6	0.0000	0.0000
93	87.08	7:3	174 181	.7969	22'33'456' ; 22'344'56	0.0707	0.0565
94	87.5	7:3	177	.8031	22'33'4'56	0.0576	0.0413
95	88	7:3 6:1	171 156	.8185	22'33'44'6 ; 233'44'5	0.2190	0.1669
96	88.44	8:4	202	.8089	22'33'55'66'	0.0000	0.0000
97	88.5	6:1	157	.8104	233'44'5'	0.0305	0.0239
98	88.91	7:3	173	.8154	22'33'456	0.0000	0.0000
99	89.36	8:4	200 204	.8197	22'33'45'66' ; 22'344'566'	0.0000	0.0000
100	89.6	7:2	172 192	.8270	22'33'455' ; 233'455'6	0.0473	0.0339
101	90.2	8:4	197	.8294	22'33'44'66'	0.0000	0.0000
102	90.4	7:2	180	.8362	22'344'55'	0.2190	0.1589
103	90.8	7:2	193	.8397	233'4'55'6	0.0101	0.0073
104	91.3	7:2	191	.8447	233'44'5'6	0.0043	0.0031
105	92.2	8:4	199	.8496	22'33'4566'	0.0179	0.0118
106	93.9	7:2	170	.8740	22'33'44'5	0.1374	0.0983
107	94.3	7:2	190	.8748	233'44'56	0.0482	0.0345
108	95.63	8:3	198	.8893	22'33'455'6	0.0000	0.0000
109	95.9	8:3	201	.8875	22'33'4'55'6	0.0472	0.0311
110	96.7	8:3	196 203	.8938	22'33'44'5'6 ; 22'344'55'6	0.0718	0.0472
111	98.6	7:1	189	.9142	233'44'55'	0.0053	0.0038
112	101.1	8:3	195	.9321	22'33'44'56	0.0169	0.0111
113	101.87	9:4	208	.9320	22'33'455'66'	0.0000	0.0000
114	103.29	9:4	207	.9423	22'33'44'566'	0.0000	0.0000
115	105.2	8:2	194	.9620	22'33'44'55'	0.0568	0.0374
116	106.77	8:2	205	.9670	233'44'55'6	0.0000	0.0000
117	114.1	9:3	206	1.010	22'33'44'55'6	0.0905	0.0591
118	126.35	10:4	209	1.050	22'33'44'55'66'	0.0000	0.0000

mass. 70 — shown from ... of 2- and 4 mono's — not promptly detected by GC/EC

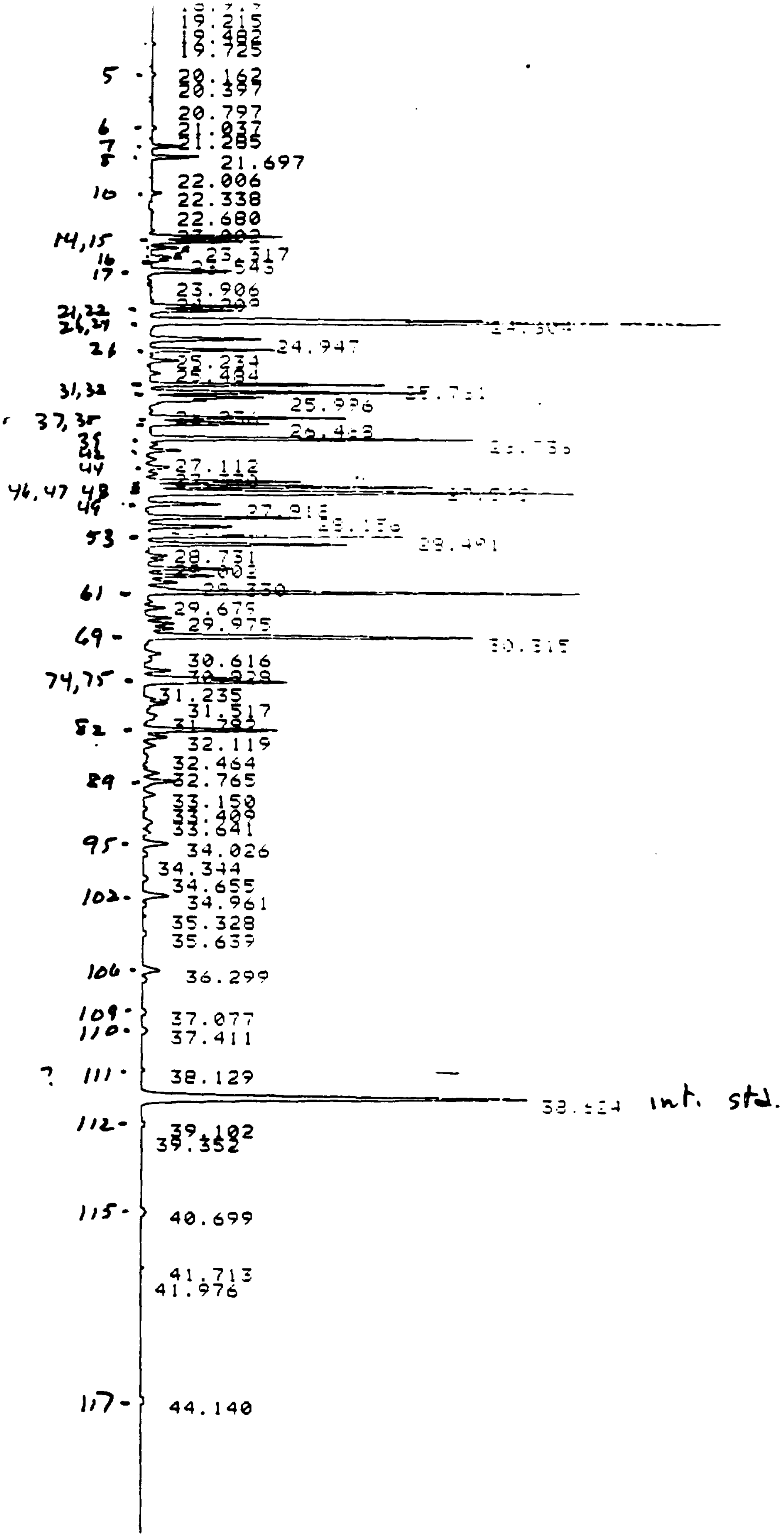
— only partly 3-3'CB — maybe ... down

CONCENTRATION = 2.9582
TOTAL MICROMOLES = 0.0104

AVERAGE MOLECULAR WEIGHT = 282.90607
NUMBER OF CALIBRATED PEAKS FOUND = 118

N. B.

14 A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117

MT32:NU14A.RLS

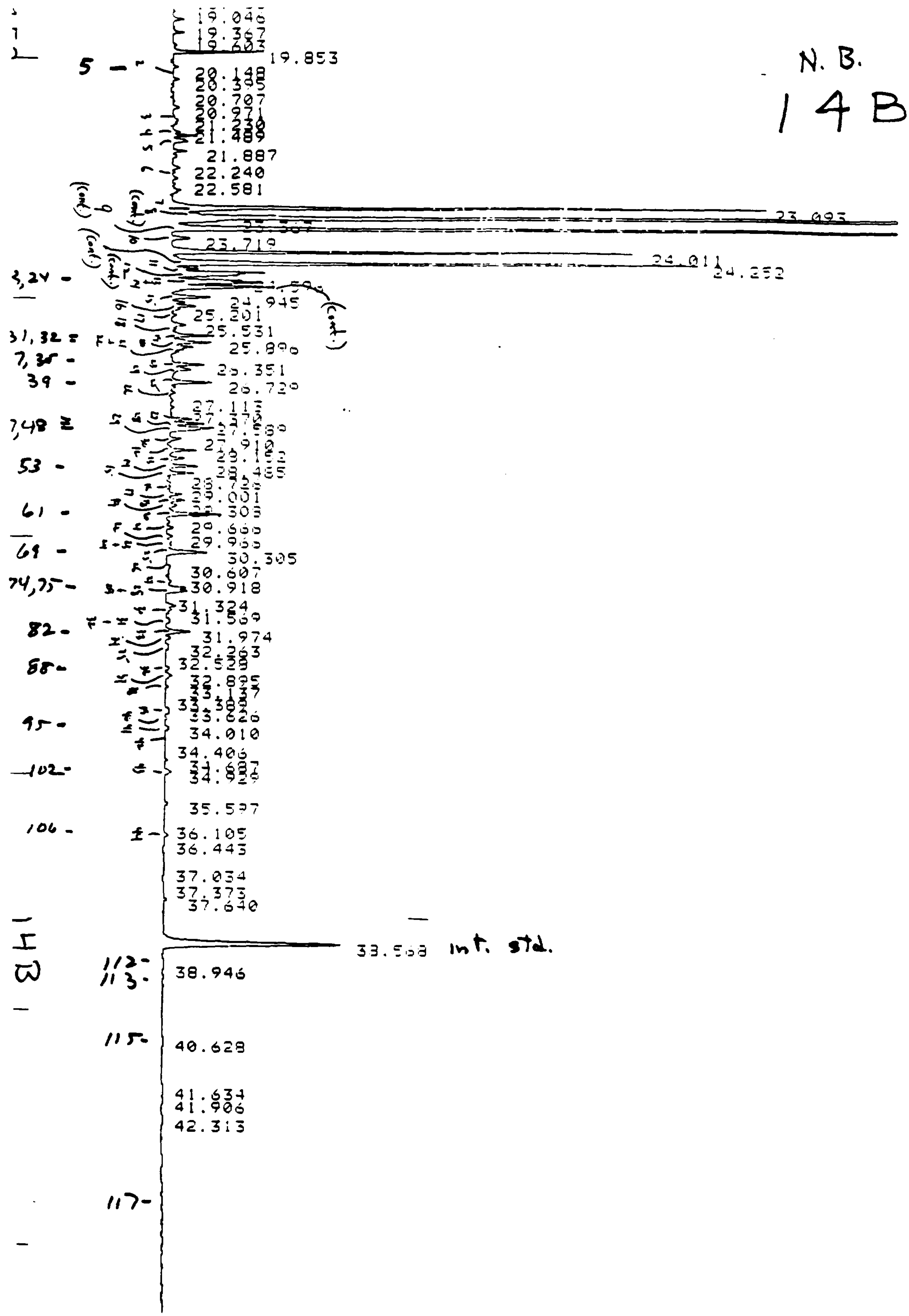
N.B. 14A

PEAK#	RLT. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.64	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.65	1:1	001	.1544	2	0.3422 ?	0.5217
3	50.37	1:0	002	.1937	3	1.9902 ?	3.0461
4	50.63	1:0	003	.1975	4	0.3079 ?	0.4694
5	52.37	2:2	004 010	.2245	22' : 26	0.7181	0.9259
6	54.77	2:1	007 009	.2566	24 : 25	0.1915	0.2470
7	55.63	2:1	006	.2709	23'	0.9652	1.2445
8	56.12	2:1	005 008	.2785	23 : 24'	1.6132	2.0800
9	57.39	2:0	014	.2973	35	0.0112	0.0144
10	57.78	3:3	019	.3045	22'6	0.4580	0.5116
11	58.86	3:2	030	.3165	246	0.0124	0.0139
12	59.2	2:0	011	.3238	33'	0.3027 ?	0.3902
13	59.51	2:0	012 013	.3297	34 : 34'	0.1793	0.2312
14	59.82	3:2 2:0	018 015	.3387	22'5 : 44'	5.1973	6.0483
15	60.03	3:2	017	.3398	22'4	2.7471	3.0687
16	60.75	3:2	024 027	.3508	236 : 23'6	0.4795	0.5311
17	61.4	3:2	016 032	.3625	22'3 : 24'6	1.7761	1.9841
18	62.15	3:1	023	.3770	235	0.0340	0.0379
19	62.33	3:1 4:4	034 054	.3800	2'35 : 22'66'	0.0373	0.0400
20	62.77	3:1	029	.3820	245	0.0482	0.0539
21	63.01	3:1	026	.3911	23'5	1.5931	1.7796
22	63.21	3:1	025	.3937	23'4	1.5064	1.6828
23	63.65	3:1	031	.4024	24'5	4.3751	4.8874
24	63.78	3:1 4:3	028 050	.4031	244' : 22'46	6.6592	7.4190
25	64.53	3:1 4:3	021 033	.4170	233' : 234 : 22'56'	2.1404	2.1596
26	65.05	3:1 4:3	022 051	.4267	234' : 22'46'	1.1944	1.2664
27	65.54	4:3	045	.4334	22'36	0.6263	0.6170
28	65.91	3:1	036	.4379	33'5	0.0115	0.0129
29	66.11	4:3	046	.4450	22'36'	0.4749	0.4678
30	66.45	3:1	039	.4488	34'5	0.0000	0.0000
31	66.66	4:2	052 073	.4554	22'55' : 23'5'6	4.8062	4.7346
32	67.02	4:2	049	.4610	22'45	4.2519	4.1886
33	67.25	4:2	047	.4639	22'44'	1.9793	1.9498
34	67.38	4:2	048 075	.4651	22'45 : 244'6	1.0056	0.9906
35	67.54	4:2	065 062	.4865	2346 : 2356	0.0819	0.0807
36	67.87	3:0	035	.4730	33'4	0.1360	0.1519
37	68.10	5:4 4:2	104 044	.4832	22'466' : 22'35'	2.6531	2.6105
38	68.47	3:0 4:2	037 042	.4870	344' : 22'34' : 233'6	2.7540	2.7356
39	69.17	4:2	064 071	.4990	23'34 : 234'6 : 23'4'6 +	2.9125	2.8691
40	69.25	4:1	068	.5040	23'45' ?	0.0000	0.0000
41	69.43	5:4	096	.5057	22'366'	0.3157	0.2783
42	69.71	4:2	040	.5102	22'33'	0.5073	0.4998
43	70.15	5:3 4:1	103 057	.5155	22'45'6 : 233'5	0.1635	0.1574
44	70.51	5:3 4:1	100 067	.5212	22'44'6 : 23'4'5	0.4470	0.4112
45	70.8	4:1	058 063	.5267	233'5' : 234'5	0.1829	0.1682
46	71.16	4:1 5:3	074 094	.5340	244'5 : 22'356'	1.6810	1.5463
47	71.39	4:1	070 061	.5407	23'4'5 : 2'345 : 23457	3.6159	3.5620
48	71.65	4:1 5:3	066 095	.5447	23'44' : 22'356 : 22'35'6	6.1019	5.4044
49	72.22	5:3 4:1	091 098	.5549	22'34'6 : 22'3'46 : 234'6	1.1693	1.0367
50	72.84	4:1	056 060	.5676	233'4' : 2344'	1.9073	1.0789
51	73.28	6:4 5:3	155 084	.5666	22'44'66' : 22'33'6: 22'356'	1.2197	1.0689
52	73.49	5:3	089	.5779	22'346'	0.0000	0.0000
53	73.72	5:2	101 090	.5814	22'34'5 : 22'45'6	3.2155	2.8356
54	74.04	5:2	099	.5880	22'44'5	2.5586	2.2549
55	74.66	6:4 5:2	150 112	.5969	22'34'66' : 233'56 : 23'44'6	0.2537	0.2236
56	74.84	5:2	083 109	.6029	22'33'5 : 233'46	0.2700	0.2458
57	75.25	6:4 5:2	152 097	.6062	22'3566' : 22'34'6 : 22'3'45	0.9067	0.7946
58	75.56	5:2	087 111	.6175	22'345' : 233'55' : 2344'6	0.5315	0.4684
59	75.9	5:2	085 116	.6224	22'344' : 234567	0.2985	0.2586
60	76.14	6:4	136	.6257	22'33'66'	0.0000	0.0000
61	76.36	4:0 5:2	077 110	.6295	33'44' : 233'4'6	3.6996	3.2604
62	76.70	6:3	154	.6349	22'44'56'	0.0738	0.0584
63	77.09	5:2	082	.6453	22'33'4	0.1860	0.1646
64	77.55	6:3	151	.6499	22'355'6	0.3349	0.2669
65	77.81	6:3 5:1	135 124	.6563	22'33'56' : 2'344'5	0.3713	0.3046
66	77.9	6:3	144	.6589	22'345'6	0.0000	0.0000
67	78.07	5:1 6:3	107 100	.6628	233'4'5 : 233'45' : 22'34'56	0.3040	0.3280
68	78.25	5:1	123	.6650	2'344'5	0.0000	0.0000
69	78.43	6:3 5:1	149 118	.6672	22'34'5'6 : 23'44'5 : 233'45	4.3068	3.5330
70	78.55	6:3	139 140	.6707	22'344'6 : 22'344'6'	0.0000	0.0000
71	79.21	6:3 5:1	134 145	.6796	22'33'56' : 22'3456': 2344'5	0.2284	0.1971
72	79.5	5:1 6:3	122 131	.6871	2'33'45: 22'33'46:22'33'55'+	0.0943	0.0797
73	80.01	6:2	146 161	.6955	22'34'55' : 233'45'6	0.3464	0.2761
74	80.30	6:3 5:1	132 105	.7035	22'33'46' : 233'44'	0.4995	0.4355
75	80.53	6:2	153	.7036	22'44'55'	3.2250	2.5711
76	81.33	6:2	160	.7060	23'44'5'6	0.0729	0.0581
77	81.54	6:2	141	.7203	22'3455'	0.1470	0.1172
78	81.72	7:4	179	.7205	22'33'566'	0.0742	0.0540
79	82.11	6:2	130	.7204	22'33'45'	0.1655	0.1319
80	82.24	6:2	137	.7329	22'344'5	0.1566	0.1240
81	82.35	7:4	176	.7305	22'33'466'	0.0000	0.0000
82	82.76	6:2	138 163	.7403	22'344'5' : 233'4'56 : +2	1.3445	1.0716
83	83.12	6:2	158	.7429	233'44'6	0.2442	0.1946
84	83.51	6:2	129	.7501	22'33'45	0.1499	0.1195
85	84	7:3	178	.7537	22'33'55'6	0.0302	0.0220
86	84.2	6:2	166	.7572	2344'56	0.0089	0.0071
87	84.5	7:3	175	.7611	22'33'45'6	0.0040	0.0035
88	84.7	7:3	187 182	.7653	22'34'55'6 : 22'344'56'	0.1626	0.1183
89	85.1	6:2	128	.7761	22'33'44'	0.2903	0.2314
90	85.4	7:3	183	.7720	22'344'5'6	0.0000	0.0000
91	85.7	6:1	167	.7814	23'44'55'	0.2962	0.2361
92	86.44	7:3	185	.7840	22'3455'6	0.0000	0.0000
93	87	7:3	174 181	.7965	22'33'456' : 22'344'56	0.1209	0.0802
94	87.5	7:3	177	.8031	22'33'4'56	0.0847	0.0610
95	88	7:3 6:1	171 156	.8185	22'33'44'6 : 233'44'5	0.2996	0.2382
96	88.44	8:4	202	.8089	22'33'55'66'	0.0000	0.0000
97	88.5	6:1	157	.8104	233'44'5'	0.0247	0.0197
98	88.91	7:3	173	.8152	22'33'456	0.0000	0.0000
99	89.36	8:4	200 204	.8197	22'33'45'66' : 22'344'566'	0.0000	0.0000
100	89.6	7:2	172 192	.8270	22'33'455' : 233'455'6	0.0523	0.0380
101	90.2	8:4	197	.8293	22'33'44'66'	0.0000	0.0000
102	90.4	7:2	180	.8362	22'344'55'	0.2413	0.1756
103	90.8	7:2	193	.8397	233'4'55'6	0.0079	0.0057
104	91.4	7:2	191	.8447	233'44'5'6	0.0037	0.0027
105	92.2	8:4	199	.8494	22'33'4566'	0.0148	0.0097
106	93.9	7:2	170	.8740	22'33'44'5	0.1583	0.1153
107	94.3	7:2	190	.8740	233'44'56	0.0476	0.0346
108	95.63	8:3	198	.8845	22'33'455'6	0.0000	0.0000
109	95.9	8:3	201	.8875	22'33'4'55'6	0.0383	0.0256
110	96.8	8:3	196 203	.8939	22'33'44'5'6 : 22'344'55'6	0.0470	0.0320
111	98.72	7:1	189	.9142	233'44'55'	0.0000	0.0000
112	101.23	8:3	195	.9321	22'33'44'56	0.0000	0.0000
113	101.87	9:4	208	.9328	22'33'455'66'	0.0000	0.0000
114	103.29	9:4	207	.9423	22'33'44'566'	0.0000	0.0000
115	105.3	8:2	194	.9620	22'33'44'55'	0.0376	0.0252
116	106.77	8:2	205	.9670	233'44'55'6	0.0000	0.0000
117	114.24	9:3	206	1.010	22'33'44'55'6	0.0000	0.0000
118	126.35	10:4	209	1.050	22'33'44'55'66'	0.0000	0.0000

CONCENTRATION = 2.648016
TOTAL MICROMOLES = 0.0092

AVERAGE MOLECULAR WEIGHT = 287.65237

N. B.
14B



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42.313

RT32:NB14B.RES

N.B. 14B

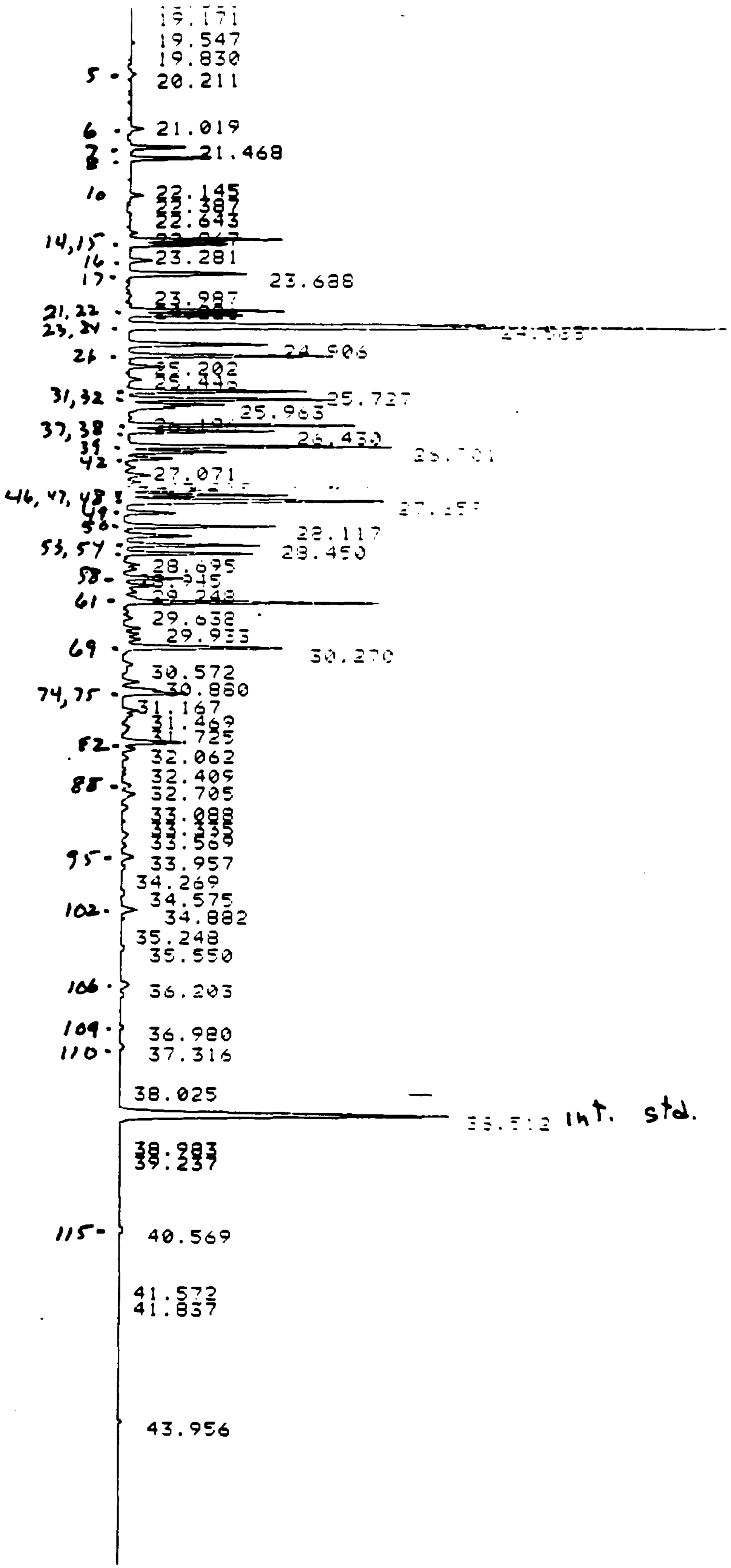
PEAK#	RET. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.64	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.64	1:1	001	.1544	2	32.3690	3[illegible].8500
3	50.12	1:0	002	.1937	3	0.0000	0.0000
4	50.64	1:0	003	.1975	4	0.0000	0.0000
5	52.14	2:2	004 010	.2245	22' ; 26	0.0007	0.0421
6	54.75	2:1	007 009	.2566	24 ; 25	0.0629	0.0655
7	55.61	2:1	006	.2709	23'	0.4494	0.4600
8	56.02	2:1	005 008	.2785	23 ; 24'	0.3936	0.4098
9	57.57	2:0	014	.2973	35	0.3223	0.3356
10	57.78	3:3	019	.3045	22'6	0.0700	0.0630
11	58.77	3:2	030	.3165	246	0.1740	0.1570
12	59.21	2:0	011	.3238	33'	0.0000	0.0000
13	59.52	2:0	012 013	.3297	34 ; 34'	0.0000	0.0000
14	59.78	3:2 2:0	018 015	.3307	22'5 ; 44'	25.1030	2[illegible].5982
15	60.06	3:2	017	.3390	22'4	0.7302	[illegible].6508
16	60.47	3:2	024 027	.3500	236 ; 23'6	0.7725	[illegible].6969
17	61.36	3:2	016 032	.3625	22'3 ; 24'6	0.0000	[illegible].0000
18	62.16	3:1	023	.3770	235	9.2142	[illegible].3180
19	62.43	3:1 4:4	034 054	.3800	2'35 ; 22'66'	0.0000	[illegible].0000
20	62.78	3:1	029	.3820	245	10.2301	[illegible].2367
21	63.04	3:1	026	.3911	23'5	0.5286	0.4769
22	63.22	3:1	025	.3937	23'4	2.1046	1.0988
23	63.66	3:1	031	.4024	24'5	1.2289	1.1084
24	63.76	3:1 4:3	028 050	.4031	244' ; 22'46	1.2214	1.0990
25	64.57	3:1 4:3	021 033	.4170	233' ; 234 ; 22'56'	0.9327	0.7600
26	64.85	3:1 4:3	022 051	.4267	234' ; 22'46'	0.1578	0.1351
27	65.55	4:3	045	.4334	22'36	0.1769	0.1408
28	65.84	3:1	036	.4379	33'5	0.0000	0.0000
29	66.07	4:3	046	.4450	22'36'	0.9850	0.7857
30	66.45	3:1	039	.4488	34'5	0.0000	0.0000
31	66.66	4:2	052 073	.4554	22'55' ; 23'5'6	1.2528	0.9968
32	67.03	4:2	049	.4610	22'45	1.0753	0.8555
33	67.26	4:2	047	.4639	22'44'	0.4567	0.3633
34	67.39	4:2	048 075	.4651	22'45 ; 244'6	0.2045	0.1627
35	67.52	4:2	065 062	.4665	2346 ; 2356	0.0717	0.0571
36	67.87	3:0	035	.4738	33'4	0.0000	0.0000
37	68.19	5:4 4:2	104 044	.4832	22'466' ; 22'35'	0.5305	0.4216
38	68.48	3:0 4:2	037 042	.4870	344' ; 22'34' ; 233'6	0.6506	0.5219
39	69.18	4:2	064 071	.4990	23'34 ; 234'6 ; 23'4'6 +	0.5489	0.4367
40	69.25	4:1	068	.5040	23'45' ?	0.0000	0.0000
41	69.41	5:4	096	.5057	22'366'	0.1659	0.1181
42	69.72	4:2	040	.5102	22'33'	0.1176	0.0936
43	70.14	5:3 4:1	103 057	.5155	22'45'6 ; 233'5	0.0000	0.0000
44	70.49	5:3 4:1	100 067	.5212	22'44'6 ; 23'4'5	0.0000	0.0000
45	70.83	4:1	058 063	.5267	233'5' ; 234'5	0.0401	0.0819
46	71.17	4:1 5:3	074 099	.5340	244'5 ; 22'356'	0.3260	0.[illegible]28
47	71.4	4:1	070 061	.5407	23'4'5 ; 2'345 ; 23457	0.5982	0.[illegible]759
48	71.64	4:1 5:3	066 095	.5447	23'44' ; 22'356 ; 22'35'6	0.9011	0.[illegible]46
49	72.26	5:3 4:1	091 098	.5549	22'34'6 ; 22'3'46 ; 233'4	0.2311	0.[illegible]62
50	72.98	4:1	056 060	.5676	233'4' ; 2344'	0.4198	0.[illegible]336
51	73.3	6:4 5:3	155 084	.5666	22'44'66' ; 22'33'6; 22'355'	0.2727	0.[illegible]930
52	73.49	5:3	089	.5779	22'346'	0.0000	0.[illegible]000
53	73.71	5:2	101 090	.5814	22'34'5 ; 22'455'	0.5411	0.[illegible]651
54	74.12	5:2	099	.5880	22'44'5	0.3718	0.[illegible]640
55	74.67	6:4 5:2	150 112	.5969	22'34'66' ; 233'56 ; 23'44'6	0.0290	0.[illegible]206
56	74.85	5:2	083 109	.6029	22'33'5 ; 233'46	0.0329	0.[illegible]231
57	75.26	6:4 5:2	152 097	.6062	22'3566' ; 22'345 ; 22'3'45	0.1506	0.[illegible]066
58	75.57	5:2	087 111	.6175	22'345' ; 233'55' ; 2344'6	0.1304	0.[illegible]985
59	75.86	5:2	085 116	.6224	22'344' ; 234567	0.1111	0.[illegible]791
60	76.13	6:4	136	.6257	22'33'66'	0.0000	0.[illegible]000
61	76.35	4:0 5:2	077 110	.6295	33'44' ; 233'4'6	0.6131	0.[illegible]363
62	76.79	6:3	154	.6349	22'44'56'	0.0000	0.[illegible]000
63	77.08	5:2	082	.6453	22'33'4	0.0475	0.[illegible]336
64	77.57	6:3	151	.6499	22'355'6	0.0595	0.[illegible]383
65	77.78	6:3 5:1	135 124	.6563	22'33'56' ; 2'344'5	0.0000	0.[illegible]000
66	77.9	6:3	144	.6584	22'345'6	0.0000	0.[illegible]000
67	78.09	5:1 6:3	107 148	.6628	233'4'5 ; 233'45' ; 22'34'56	0.0631	0.[illegible]35
68	78.25	5:1	123	.6658	2'344'5	0.0000	0.[illegible]000
69	78.45	6:3 5:1	149 118	.6672	22'34'5'6 ; 23'44'5 ; 233'45	0.6635	0.[illegible]97
70	78.55	6:3	139 140	.6707	22'344'6 ; 22'344'6'	0.0000	0.[illegible]97
71	79.23	6:3 5:1	134 143	.6796	22'33'56' ; 22'3456'; 2344'5	0.0281	0.[illegible]196
72	79.53	5:1 6:3	122 131	.6871	2'33'45; 22'33'46;22'33'55'+	0.0000	0.[illegible]000
73	80.03	6:2	146 161	.6955	22'34'55' ; 233'45'6	0.0433	0.[illegible]79
74	80.3	6:3 5:1	132 105	.7035	22'33'46' ; 233'44'	0.1321	0.[illegible]38
75	80.5	6:2	153	.7036	22'44'55'	0.5343	0.[illegible]39
76	81.3	6:2	168	.7068	23'44'5'6	0.0813	0.[illegible]23
77	81.5	6:2	141	.7203	22'3455'	0.0310	0.[illegible]205
78	81.7	7:4	179	.7205	22'33'566'	0.0000	0.0000
79	82.09	6:2	138	.7284	22'33'45'	0.0000	0.0000
80	82.2	6:2	137	.7329	22'344'5	0.0000	0.0000
81	82.35	7:4	176	.7303	22'33'466'	0.0000	0.0000
82	82.7	6:2	130 163	.7403	22'344'5' ; 233'4'56 ; +2	0.2560	0.[illegible]161
83	83.1	6:2	158	.7429	233'44'6	0.0345	0.[illegible]282
84	83.49	6:2	129	.7501	22'33'45	0.0000	0.0000
85	84	7:3	178	.7537	22'33'55'6	0.0000	0.0000
86	84.28	6:2	166	.7572	2344'56	0.0000	0.0000
87	84.4	7:3	175	.7611	22'33'45'6	0.0000	0.0000
88	84.7	7:3	187 182	.7653	22'34'55'6 ; 22'344'56'	0.0381	0.[illegible]294
89	85.1	6:2	128	.7761	22'33'44'	0.0515	0.[illegible]392
90	85.4	7:3	183	.7720	22'344'5'6	0.0000	0.0000
91	85.76	6:1	167	.7814	23'44'55'	0.0000	0.0000
92	86.44	7:3	185	.7848	22'3455'6	0.0000	0.0000
93	87.03	7:3	174 181	.7965	22'33'456' ; 22'344'56	0.0000	0.0000
94	87.57	7:3	177	.8031	22'33'4'56	0.0000	0.0000
95	88	7:3 6:1	171 156	.8105	22'33'44'6 ; 233'44'5	0.0323	0.[illegible]252
96	88.44	8:4	202	.8089	22'33'55'66'	0.0000	0.0000
97	88.55	6:1	157	.8106	233'44'5'	0.0000	0.0000
98	88.91	7:3	173	.8152	22'33'456	0.0000	0.0000
99	89.36	8:4	200 204	.8197	22'33'45'66' ; 22'344'566'	0.0000	0.0000
100	89.68	7:2	172 192	.8278	22'33'455' ; 233'455'6	0.0000	0.0000
101	90.2	8:4	197	.8293	22'33'44'66'	0.0000	0.0000
102	90.49	7:2	180	.8362	22'344'55'	0.0000	0.0000
103	90.91	7:2	193	.8397	233'4'55'6	0.0000	0.0000
104	91.44	7:2	191	.8447	233'44'5'6	0.0000	0.0000
105	92.15	8:4	199	.8494	22'33'4566'	0.0000	0.0000
106	94.0	7:2	170	.8740	22'33'44'5	0.0139	0.00[illegible]2
107	94.44	7:2	190	.8748	233'44'56	0.0000	0.0000
108	95.63	8:3	198	.8845	22'33'455'6	0.0000	0.0000
109	95.99	8:3	201	.8875	22'33'4'55'6	0.0000	0.0000
110	96.85	8:3	196 203	.8935	22'33'44'5'6 ; 22'344'55'6	0.0000	0.0000
110	98.72	7:1	189	.9142	233'44'55'	0.0000	0.0000

CONCENTRATION = 4.702611
TOTAL MICROMOLES = 0.0202

AVERAGE MOLECULAR WEIGHT = 232.31413
NUMBER OF CALIBRATED PEAKS FOUND = 111

N.B.

17A



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17A

RT32:NB17A.RES

N.B. 17A

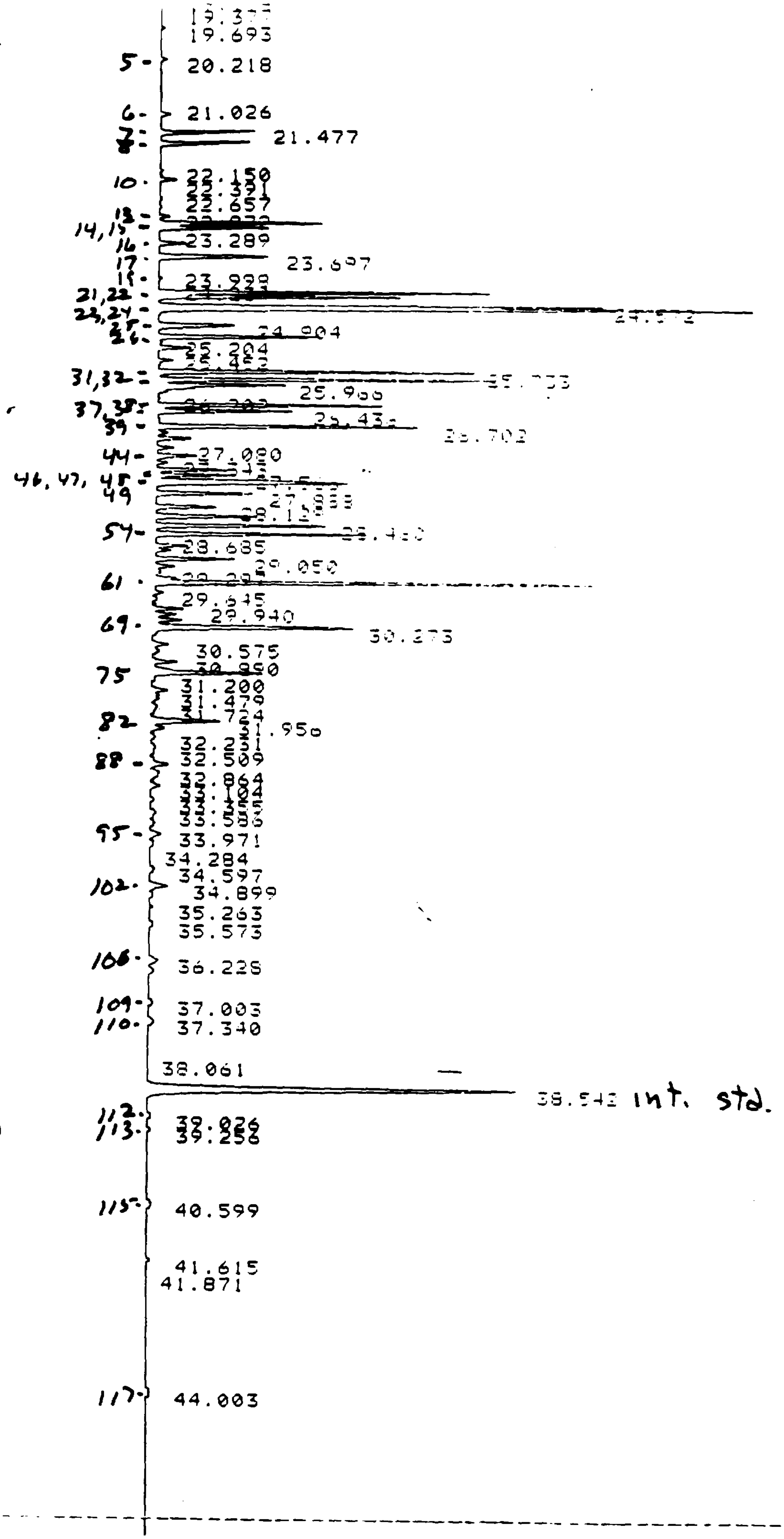
PEAK#	RET. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.62	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.63	1:1	001	.1544	2	0.3909	0.5764
3	50.08	1:0	002	.1937	3	1.1414	1.6828
4	50.59	1:0	003	.1975	4	0.1759	0.2593
5	52.36	2:2	004 010	.2245	22' | 26	1.1720	1.4615
6	54.77	2:1	007 009	.2546	24 | 25	0.6290	0.7845
7	55.6	2:1	006	.2709	23'	2.3448	2.9241
8	56.12	2:1	005 008	.2785	23 | 24'	3.1987	3.9889
9	57.46	2:0	014	.2973	35	0.0637	0.0794
10	57.77	3:3	019	.3045	22'6	0.6462	0.6982
11	58.66	3:2	030	.3165	246	0.0370	0.0409
12	59.02	2:0	011	.3230	33'	0.2593	0.3234
13	59.49	2:0	012 013	.3297	34 | 34'	0.5122	0.6387
14	59.82	3:2 2:0	018 015	.3387	22'5 | 44'	6.4245	7.2312
15	60.03	3:2	017	.3398	22'4	3.6265	3.9163
16	60.73	3:2	024 027	.3508	236 | 23'6	0.6289	0.6795
17	61.35	3:2	016 032	.3625	22'3 | 24'6	3.0737	3.3210
18	62.13	3:1	023	.3770	235	0.0078	0.0084
19	62.34	3:1 4:4	034 054	.3800	2'35 | 22'66'	0.1023	0.1062
20	62.75	3:1	029	.3820	245	0.0551	0.0595
21	63.01	3:1	026	.3911	23'5	2.7515	2.9729
22	63.19	3:1	025	.3937	23'4	2.2605	2.4422
23	63.63	3:1	031	.4024	24'5	5.3080	5.7351
24	63.76	3:1 4:3	028 050	.4031	244' | 22'46	7.8260	8.4331
25	64.51	3:1 4:3	021 033	.4170	233' | 234 | 22'56'	2.8567	2.7077
26	65.03	3:1 4:3	022 051	.4267	234' | 22'46'	2.1039	2.2396
27	65.52	4:3	045	.4334	22'36	0.8463	0.8063
28	65.91	3:1	036	.4379	33'5	0.0263	0.0284
29	66.09	4:3	046	.4450	22'36'	0.6281	0.5985
30	66.3	3:1	039	.4480	34'5	0.0336	0.0363
31	66.64	4:2	052 073	.4554	22'55' | 23'5'6	4.4960	4.2838
32	67.03	4:2	049	.4610	22'45	3.9415	3.7559
33	67.26	4:2	047	.4639	22'44'	1.8447	1.7576
34	67.39	4:2	048 075	.4651	22'45 | 244'6	0.9782	0.9321
35	67.52	4:2	065 062	.4665	2346 | 2356	0.0663	0.0632
36	67.86	3:0	035	.4738	33'4	0.1554	0.1679
37	68.19	5:4 4:2	104 044	.4832	22'466' | 22'35'	3.3955	3.2315
38	68.45	3:0 4:2	037 042	.4870	344' | 22'34' | 234'6	3.1116	2.9894
39	68.95	4:2	064 071	.4990	23'34 | 234'6 | 23'4'6 +	0.0277	0.0264
40	69.25	4:1	068	.5040	23'45' 7	0.0000	0.0000
41	69.41	5:4	096	.5057	22'366'	2.8853	2.4594
42	69.72	4:2	040	.5102	22'33'	0.8068	0.7687
43	70.11	5:3 4:1	103 057	.5155	22'45'6 | 233'5	0.1803	0.1679
44	70.48	5:3 4:1	100 067	.5212	22'44'6 | 23'45	0.5892	0.5242
45	70.81	4:1	058 063	.5267	233'5' | 234'5	0.2554	0.2434
46	71.15	4:1 5:3	074 094	.5340	244'5 | 22'356'	1.4639	1.3024
47	71.38	4:1	070 061	.5407	23'4'5 | 2'345 | 24457	2.1928	2.0893
48	71.64	4:1 5:3	066 095	.5447	23'44' | 22'356 | 22'35'6	4.3872	3.7583
49	72.21	5:3 4:1	091 098	.5549	22'34'6 | 22'3'46 | 233'4	0.9399	0.8094
50	72.83	4:1	056 060	.5676	233'4' | 2344'	1.9387	1.8472
51	73.27	6:4 5:3	155 084	.5666	22'44'66' | 22'33'6; 22'355'	1.0020	0.9172
52	73.49	5:3	089	.5779	22'346'	0.0000	0.0000
53	73.72	5:2	101 090	.5814	22'34'5 | 22'455'	2.0530	1.7500
54	74.08	5:2	099	.5880	22'44'5	1.7302	1.4748
55	74.67	6:4 5:2	150 112	.5969	22'34'66' | 233'56 | 23'44'6	0.1806	0.1539
56	74.83	5:2	083 109	.6029	22'33'5 | 233'46	0.2753	0.2346
57	75.2	6:4 5:2	152 097	.6062	22'3566' | 22'345 | 22'3'45	0.7369	0.6296
58	75.5	5:2	087 111	.6175	22'345' | 233'55' | 2344'6	0.2434	0.2075
59	75.8	5:2	085 116	.6224	22'344' | 234567	0.1222	0.1041
60	76.13	6:4	136	.6257	22'33'66'	0.0000	0.0000
61	76.3	4:0 5:2	077 110	.6295	33'44' | 233'4'6	2.4760	2.1105
62	76.7	6:3	154	.6349	22'44'56'	0.0595	0.0459
63	77	5:2	082	.6453	22'33'4	0.0860	0.0733
64	77.5	6:3	151	.6499	22'355'6	0.2401	0.1913
65	77.8	6:3 5:1	135 124	.6563	22'33'56' | 2'344'5	0.2310	0.1833
66	77.9	6:3	144	.6504	22'345'6	0.0000	0.0000
67	78	5:1 6:3	107 108	.6628	233'4'5 | 233'45' | 22'34'56	0.2925	0.2416
68	78.25	5:1	123	.6650	2'344'5	0.0000	0.0000
69	78.4	6:3 5:1	149 118	.6672	22'34'5'6 | 23'44'5 | 233'45	2.3465	1.8621
70	78.55	6:3	139 140	.6707	22'344'6 | 22'344'6'	0.0000	0.0000
71	79.2	6:3 5:1	134 143	.6796	22'33'56' | 22'3456'; 2344'5	0.1671	0.1395
72	79.4	5:1 6:3	122 131	.6871	2'33'45; 22'33'46;22'33'55'+	0.0620	0.0507
73	80	6:2	146 161	.6955	22'34'55' | 233'45'6	0.2403	0.1852
74	80.3	6:3 5:1	132 105	.7035	22'33'46' | 233'44'	0.2001	0.1607
75	80.5	6:2	153	.7036	22'44'55'	1.8745	1.4451
76	81.3	6:2	168	.7068	23'44'5'6	0.1237	0.0953
77	81.5	6:2	141	.7203	22'3455'	0.0751	0.0579
78	81.7	7:4	179	.7205	22'33'566'	0.0644	0.0460
79	82	6:2	130	.7284	22'33'45'	0.0925	0.0713
80	82.2	6:2	137	.7329	22'344'5	0.0000	0.0000
81	82.35	7:4	176	.7385	22'33'466'	0.0000	0.0000
82	82.7	6:2	138 163	.7408	22'344'5' | 233'4'56 | +2	0.7104	0.5477
83	83	6:2	158	.7429	233'44'6	0.1470	0.1133
84	83.4	6:2	129	.7501	22'33'45	0.0774	0.0597
85	83.9	7:3	178	.7537	22'33'55'6	0.0260	0.0189
86	84.25	6:2	166	.7572	2344'56	0.0000	0.0000
87	84.4	7:3	175	.7611	22'33'45'6	0.0000	0.0000
88	84.7	7:3	187 182	.7654	22'34'55'6 | 22'344'56'	0.1161	0.0817
89	85.1	6:2	128	.7761	22'33'44'	0.1524	0.1175
90	85.4	7:3	183	.7720	22'344'5'6	0.0000	0.0000
91	85.7	6:1	167	.7814	23'44'55'	0.1460	0.1125
92	86.3	7:3	185	.7848	22'3455'6	0.0104	0.0073
93	86.9	7:3	174 181	.7965	22'33'456' | 22'344'56	0.0580	0.0415
94	87.4	7:3	177	.8031	22'33'4'56	0.0367	0.0259
95	87.9	7:3 6:1	171 156	.8105	22'33'44'6 | 233'44'5	0.1515	0.1136
96	88.4	8:4	202	.8089	22'33'55'66'	0.0182	0.0118
97	88.7	6:1	157	.8104	233'44'5'	0.0035	0.0027
98	88.91	7:3	173	.8154	22'33'456	0.0000	0.0000
99	89.2	8:4	200 204	.8197	22'33'45'66' | 22'344'566'	0.0000	0.0000
100	89.68	7:2	172 192	.8278	22'33'455' | 233'455'6	0.0000	0.0000
101	90.3	8:4	197	.8293	22'33'44'66'	0.1401	0.0907
102	90.49	7:2	180	.8362	22'344'55'	0.0000	0.0000
103	90.91	7:2	193	.8397	233'4'55'6	0.0000	0.0000
104	91.3	7:2	191	.8447	233'44'5'6	0.0029	0.0020
105	92	8:4	199	.8494	22'33'4566'	0.0184	0.0119
106	93.8	7:2	170	.8740	22'33'44'5	0.0805	0.0564
107	94.3	7:2	190	.8748	233'44'56	0.0296	0.0209
108	95.8	8:3	198	.8845	22'33'455'6	0.0170	0.0115
109	96.2	8:3	201	.8875	22'33'4'55'6	0.0000	0.0000
110	96.6	8:3	196 203	.8935	22'33'44'5'6 | 22'344'55'6	0.0364	0.0236
111	98.5	7:1	189	.9148	233'44'55'	0.0042	0.0030
112	101	8:3	195	.9321	22'33'44'56	0.0050	0.0033
113	101.7	9:4	208	.9320	22'33'455'66'	0.0018	0.0011
114	103.4	9:4	207	.9428	22'33'44'566'	0.0016	0.0010
115	105.1	8:2	194	.9620	22'33'44'55'	0.0264	0.0172
116	106.1	8:2	205	.96'6	233'44'55'6	0.0000	0.0000
117	113.8	9:3	206	1.010	22'33'44'55'6	0.0472	0.0283
118	126.35	10:4	209	1.050	22'33'44'55'66'	0.0000	0.0000

CONCENTRATION = 2.746371
TOTAL MICROMOLES = 0.0099

AVERAGE MOLECULAR WEIGHT = 278.21794
NUMBER OF CALIBRATED PEAKS FOUND = 118

N. B.

17B



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RT32:NH17B.RES

N.B. 17B

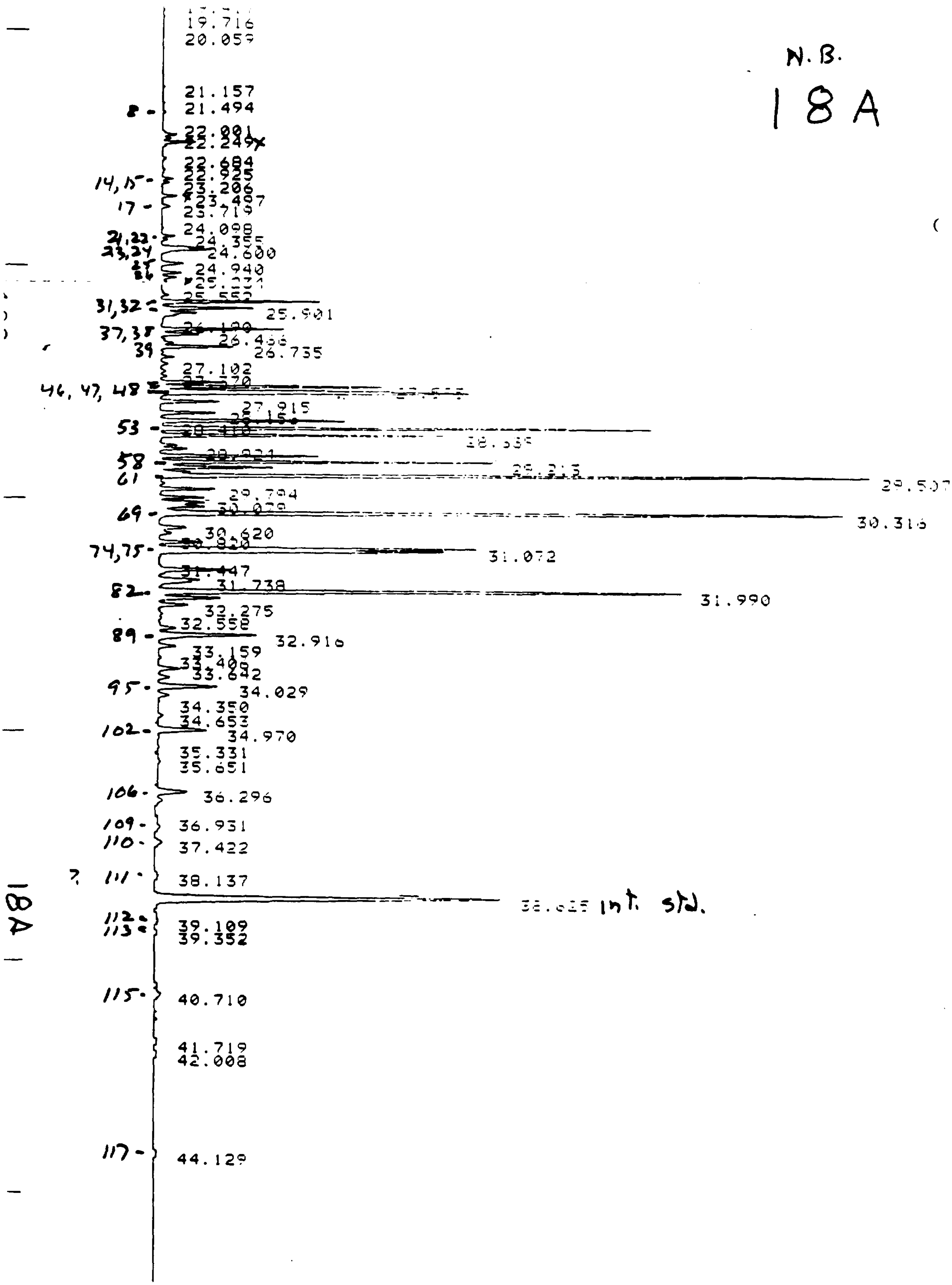
mass spec. shows traces of all three mono's - but probably not being detected by GC/EC

PEAK#	RET. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.62	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.72	1:1	001	.1544	2	0.0000	0.0000
3	50.29	1:0	002	.1937	3	0.0000	0.0000
4	50.59	1:0	003	.1975	4	0.1609 ?	0.2380
5	52.33	2:2	004 010	.2245	22' ; 26	1.1259	1.4133
6	54.74	2:1	007 009	.2566	24 ; 25	0.4294	0.5340
7	55.59	2:1	006	.2709	23'	3.1287	3.9273
8	56.09	2:1	005 008	.2785	23 ; 24'	2.9266	3.6736
9	57.33	2:0	014	.2973	35	0.0816	0.1024
10	57.77	3:3	019	.3045	22'6	0.7039	0.7655
11	58.02	3:2	030	.3165	246	0.0000	0.0000
12	59.04	2:0	011	.3230	33'	0.3164	0.3971
13	59.48	2:0	012 013	.3297	34 ; 34'	0.5436	0.6823
14	59.82	3:2 2:0	018 015	.3387	22'5 ; 44'	6.1088	7.0117
15	60	3:2	017	.3398	22'4	3.4074	3.7057
16	60.72	3:2	024 027	.3508	236 ; 23'6	0.5623	0.6115
17	61.35	3:2	016 032	.3625	22'3 ; 24'6	2.4853	2.7030
18	62.12	3:1	023	.3770	235	0.0071	0.0077
19	62.43	3:1 4:4	034 054	.3800	2'35 ; 22'66'	0.0000	0.0000
20	62.72	3:1	029	.3820	245	0.0056	0.0061
21	62.98	3:1	026	.3911	23'5	4.6769	5.0864
22	63.18	3:1	025	.3937	23'4	3.9424	4.2876
23	63.6	3:1	031	.4024	24'5	6.0788	6.6111
24	63.73	3:1 4:3	028 050	.4031	244' ; 22'46	6.8832	7.4660
25	64.48	3:1 4:3	021 033	.4178	233' ; 234 ; 22'56'	1.7056	1.6753
26	65	3:1 4:3	022 051	.4267	234' ; 22'46'	1.6494	1.7026
27	65.52	4:3	045	.4334	22'36	0.6757	0.6481
28	65.84	3:1	036	.4379	33'5	0.0000	0.0000
29	66.09	4:3	046	.4450	22'36'	0.5094	0.4885
30	66.45	3:1	039	.4480	34'5	0.0000	0.0000
31	66.63	4:2	052 073	.4554	22'55' ; 23'5'6	6.2890	6.0315
32	66.97	4:2	049	.4610	22'45	5.1212	4.9116
33	67.23	4:2	047	.4639	22'44'	2.2035	2.1133
34	67.36	4:2	048 075	.4651	22'45 ; 244'6	0.5560	0.5332
35	67.51	4:2	065 062	.4865	2346 ; 2356	0.0856	0.0821
36	67.85	3:0	035	.4738	33'4	0.0663	0.0721
37	68.16	5:4 4:2	104 044	.4832	22'466' ; 22'35'	3.0281	2.9008
38	68.44	3:0 4:2	037 042	.4870	344' ; 22'34' ; 233'6	2.5881	2.5028
39	69.14	4:2	064 071	.4990	23'34 ; 234'6 ; 23'4'6 +	2.4017	2.3034
40	69.25	4:1	068	.5044	23'45' 7	0.0000	0.0000
41	69.43	5:4	096	.5057	22'366'	0.3465	0.2973
42	69.69	4:2	040	.5102	22'33'	0.5302	0.5085
43	70.1	5:3 4:1	103 057	.5155	22'45'6 ; 233'5	0.3064	0.2871
44	70.45	5:3 4:1	100 067	.5212	22'44'6 ; 23'4'5	0.8325	0.7456
45	70.8	4:1	058 063	.5267	233'5' ; 234'5	0.1859	0.1783
46	71.11	4:1 5:3	074 094	.5340	244'5 ; 22'356'	0.7878	0.7056
47	71.37	4:1	070 061	.5407	23'4'5 ; 2'345 ; 23457	0.9331	0.8949
48	71.66	4:1 5:3	066 095	.5447	23'44' ; 22'356 ; 22'35'6	1.3157	1.1345
49	72.2	5:3 4:1	091 094	.5549	22'34'6 ; 22'3'46 ; 233'4	1.4901	1.2987
50	72.82	4:1	056 060	.5676	233'4' ; 2344'	0.7852	0.7531
51	73.26	6:4 5:3	155 084	.5666	22'44'66' ; 22'33'6; 22'355'	1.4681	1.2458
52	73.49	5:3	089	.5779	22'346'	0.0000	0.0000
53	73.68	5:2	101 090	.5814	22'34'5 ; 22'455'	2.2893	1.9642
54	74.09	5:2	099	.5880	22'44'5	2.5669	2.2024
55	74.61	6:4 5:2	150 112	.5969	22'34'66' ; 233'56 ; 24'44'6	0.3650	0.3132
56	74.82	5:2	083 109	.6029	22'33'5 ; 233'46	0.3100	0.2659
57	75.21	6:4 5:2	152 097	.6062	22'3566' ; 22'345 ; 22'3'45	0.8502	0.7294
58	75.54	5:2	087 111	.6175	22'345' ; 233'55' ; 2344'6	0.1627	0.1396
59	75.72	5:2	085 116	.6224	22'344' ; 234567	0.0494	0.0424
60	76.11	6:4	136	.6257	22'33'66'	0.3641	0.2825
61	76.37	4:0 5:2	077 110	.6295	33'44' ; 233'4'6	3.4789	2.9848
62	76.76	6:3	154	.6349	22'44'56'	0.1225	0.0950
63	77.04	5:2	082	.6453	22'33'4	0.0252	0.0216
64	77.51	6:3	151	.6499	22'355'6	0.3973	0.3083
65	77.77	6:3 5:1	135 124	.6565	22'33'56' ; 2'344'5	0.2882	0.2302
66	77.9	6:3	144	.6584	22'345'6	0.0000	0.0000
67	78.03	5:1 6:3	107 109	.6620	233'4'5 ; 233'45' ; 22'34'56	0.3805	0.3164
68	78.25	5:1	123	.6650	2'344'5	0.0000	0.0000
69	78.39	6:3 5:1	149 118	.6672	22'34'5'6 ; 23'44'5 ; 233'45	2.7690	2.2125
70	78.55	6:3	139 140	.6707	22'344'6 ; 22'344'6'	0.0000	0.0000
71	79.17	6:3 5:1	134 143	.6796	22'33'56' ; 22'3456' ; 2344'5	0.1865	0.1566
72	79.46	5:1 6:3	122 131	.6871	2'33'45; 22'33'46;22'33'55'+	0.0687	0.0565
73	80	6:2	146 161	.6955	22'34'55' ; 233'45'6	0.3492	0.2709
74	80.35	6:3 5:1	132 105	.7035	22'33'46' ; 233'44'	{ 0.0000	0.0000
75	80.52	6:2	153	.7036	22'44'55'	{ 3.1224	2.4229
76	81.29	6:2	168	.7068	23'44'5'6	0.1178	0.0914
77	81.5	6:2	141	.7203	22'3455'	0.0325	0.0252
78	81.71	7:4	179	.7205	22'33'566'	0.0997	0.0706
79	82.04	6:2	130	.7284	22'33'45'	0.0920	0.0714
80	82.2	6:2	137	.7329	22'344'5	0.0000	0.0000
81	82.35	7:4	176	.7305	22'33'466'	0.0000	0.0000
82	82.74	6:2	138 163	.7403	22'344'5' ; 233'4'56 ; +2	0.7395	0.5738
83	83.05	6:2	158	.7429	233'44'6	0.1345	0.1046
84	83.44	6:2	129	.7501	22'33'45	0.0336	0.0261
85	83.94	7:3	178	.7537	22'33'55'6	0.0385	0.0273
86	84.25	6:2	166	.7572	2344'56	0.0000	0.0000
87	84.4	7:3	175	.7611	22'33'45'6	0.0000	0.0000
88	84.74	7:3	187 182	.7653	22'34'55'6 ; 22'344'56'	0.1943	0.1376
89	85.1	6:2	128	.7761	22'33'44'	0.0574	0.0445
90	85.4	7:3	183	.7720	22'344'5'6	0.0000	0.0000
91	85.72	6:1	167	.7814	23'44'55'	0.1821	0.1413
92	86.34	7:3	185	.7846	22'3455'6	0.0095	0.0067
93	86.97	7:3	174 181	.7965	22'33'456' ; 22'344'56	0.0445	0.0316
94	87.46	7:3	177	.8031	22'33'4'56	0.0305	0.0217
95	87.98	7:3 6:1	171 156	.8105	22'33'44'6 ; 233'44'5	0.1104	0.0833
96	88.42	8:4	202	.8089	22'33'55'66'	0.0138	0.0087
97	88.55	6:1	157	.8164	233'44'5'	0.0000	0.0000
98	88.91	7:3	173	.8152	22'33'456	0.0000	0.0000
99	89.36	8:4	200 204	.8197	22'33'45'66' ; 22'344'566'	0.0000	0.0000
100	89.50	7:2	172 192	.8278	22'33'455' ; 233'455'6	0.0364	0.0258
101	90.3	8:4	197	.8293	22'33'44'66'	0.1444	0.0941
102	90.7	7:2	180	.8362	22'344'55'	0.0139	0.0098
103	90.91	7:2	193	.8397	233'4'55'6	0.0000	0.0000
104	91.44	7:2	191	.8447	233'44'5'6	0.0000	0.0000
105	92.15	8:4	199	.8494	22'33'4566'	0.0000	0.0000
106	93.0	7:2	170	.8748	22'33'44'5	0.0736	0.0521
107	94.2	7:2	190	.8790	233'44'56	0.0339	0.0240
108	95.0	8:3	198	.8845	22'33'455'6	0.0235	0.0153
109	95.99	8:3	201	.8875	22'33'4'55'6	0.0000	0.0000
110	96.6	8:3	196 203	.8935	22'33'44'5'6 ; 22'344'55'6	0.0521	0.0339
111	98.72	7:1	189	.9142	233'44'55'	0.0000	0.0000
112	101.23	8:3	195	.9321	22'33'44'56	0.0000	0.0000
113	101.87	9:4	208	.9324	22'33'455'66'	0.0000	0.0000
114	103.29	9:4	207	.9423	22'33'44'566'	0.0000	0.0000
115	105.1	8:2	194	.9620	22'33'44'55'	0.0337	0.0220
116	106.77	8:2	205	.9678	233'44'55'6	0.0000	0.0000
117	114.24	9:3	206	1.010	22'33'44'55'6	0.0000	0.0000
118	126.35	10:4	209	1.050	22'33'44'55'66'	0.0000	0.0000

CONCENTRATION = 2.790644
TOTAL MICROMOLES = 0.0100

AVERAGE MOLECULAR WEIGHT = 280.04737
NUMBER OF CALIBRATED PEAKS FOUND = 118

N.B. 18A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18A

MT52:MB18A.RLS

N.B. 18A

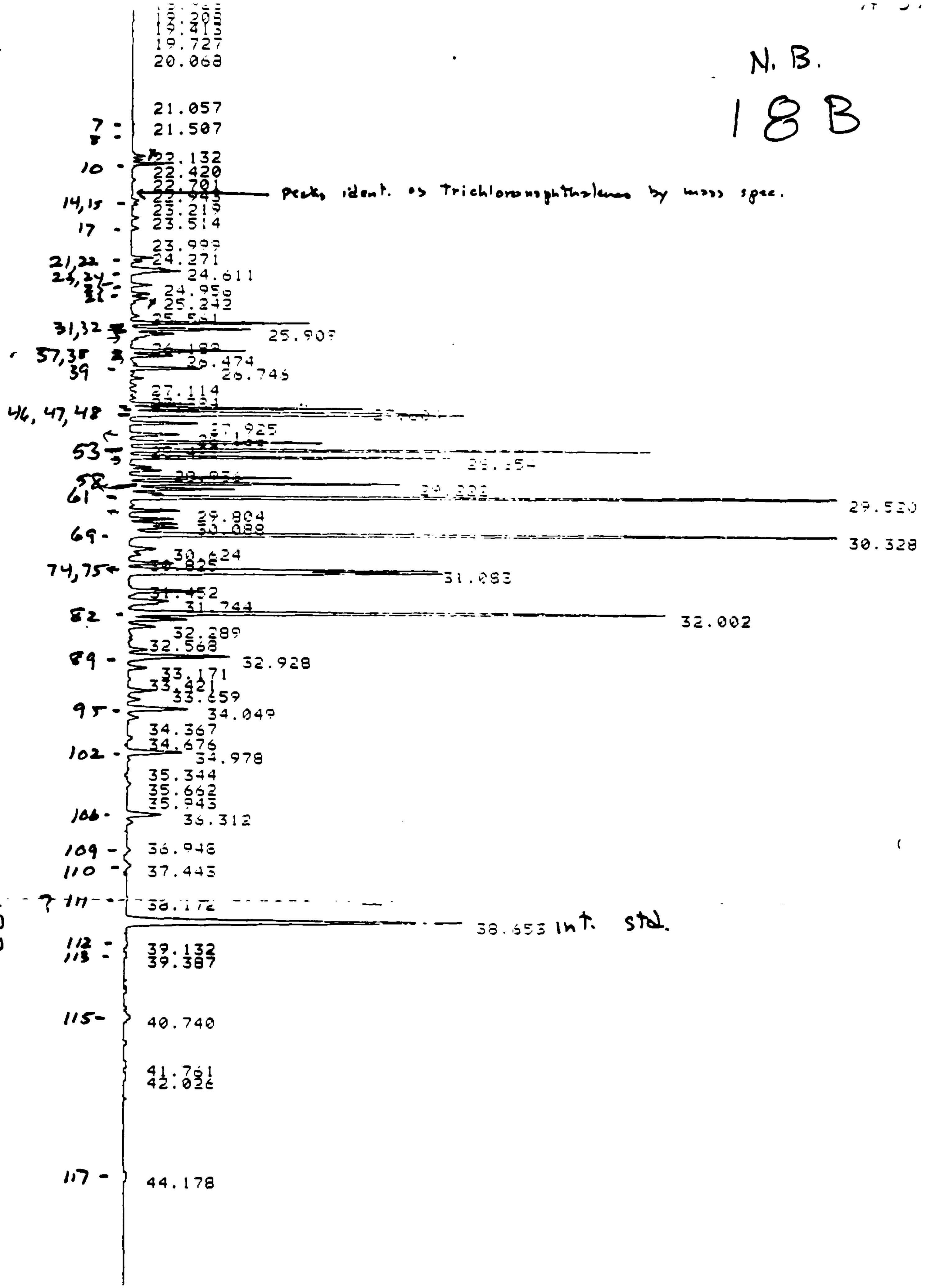
PEAK#	RLT. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.59	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.57	1:1	001	.1544	2	0.2086	0.3266
3	50.19	1:0	002	.1957	3	3.5132	5.7555
4	50.61	1:0	003	.1975	4	0.8119	1.3302
5	52.13	2:2	004 010	.2245	22' : 26	0.0000	0.0000
6	54.69	2:1	007 009	.2566	24 : 25	0.0421	0.0503
7	55.57	2:1	006	.2709	23'	0.0215	0.0290
8	56.07	2:1	005 008	.2785	23 : 24'	0.1013	0.1404
9	57.31	2:0	014	.2973	35	0.7059	0.9701
10	57.75	3:3	019	.3045	22'6	1.6013	2.0189
11	58.65	3:2	030	.3165	246	0.0728	0.0874
12	59.27	2:0	011	.3230	33'	0.6652	0.9217
13	59.52	2:0	012 013	.3297	34 : 34'	0.0000	0.0000
14	59.79	3:2 2:0	018 015	.3387	22'5 : 44'	0.5001	0.6254
15	60	3:2	017	.3398	22'4	0.2819	0.3384
16	60.75	3:2	024 027	.3508	236 : 23'6	0.3630	0.4358
17	61.32	3:2	016 032	.3625	22'3 : 24'6	0.2801	0.3363
18	62.3	3:1	023	.3770	235	0.0120	0.0144
19	62.48	3:1 4:4	034 054	.3800	2'35 : 22'66'	0.0394	0.0454
20	62.72	3:1	029	.3820	245	0.0094	0.0113
21	62.97	3:1	026	.3911	23'5	0.2772	0.3328
22	63.15	3:1	025	.3937	23'4	0.1576	0.1892
23	63.59	3:1	031	.4024	24'5	0.5966	0.7163
24	63.72	3:1 4:3	028 050	.4031	244' : 22'46	0.8890	1.0644
25	64.47	3:1 4:3	021 053	.4170	233' : 234 : 22'56'	0.5509	0.6068
26	64.99	3:1 4:3	022 051	.4267	234' : 22'46'	0.2522	0.2874
27	65.48	4:3	045	.4334	22'36	0.1184	0.1254
28	65.84	3:1	036	.4379	33'5	0.0000	0.0000
29	66.08	4:3	046	.4450	22'36'	0.1318	0.1395
30	66.45	3:1	039	.4488	34'5	0.0000	0.0000
31	66.6	4:2	052 073	.4554	22'55' : 23'5'6	4.3380	4.5927
32	66.98	4:2	049	.4610	22'45	2.1587	2.2854
33	67.22	4:2	047	.4639	22'44'	0.7985	0.8454
34	67.35	4:2	048 075	.4651	22'45 : 244'6	0.3079	0.3260
35	67.73	4:2	065 062	.4665	2346 : 2356	0.0420	0.0445
36	67.87	3:0	035	.4738	33'4	0.0000	0.0000
37	68.15	5:4 4:2	104 044	.4832	22'466' : 22'35'	2.0226	2.1389
38	68.43	3:0 4:2	037 042	.4870	344' : 22'34' : 233'6	1.0008	1.0769
39	69.13	4:2	064 071	.4998	23'34 : 234'6 : 23'4'6 +	0.9208	0.9749
40	69.25	4:1	068	.5040	23'45' 7	0.0000	0.0000
41	69.42	5:4	096	.5057	22'366'	0.0971	0.0920
42	69.67	4:2	040	.5102	22'33'	0.2448	0.2592
43	70.09	5:3 4:1	103 057	.5155	22'45'6 : 233'5	0.1903	0.2050
44	70.48	5:3 4:1	100 067	.5212	22'44'6 : 23'4'5	0.1612	0.1599
45	70.76	4:1	058 063	.5267	233'5' : 234'5	0.1251	0.1324
46	71.1	4:1 5:3	074 094	.5348	244'5 : 22'356'	0.9078	0.8975
47	71.36	4:1	070 061	.5407	23'4'5 : 2'345 : 23457	3.5948	3.8055
48	71.62	4:1 5:3	066 095	.5447	23'44' : 22'356 : 22'35'6	2.6439	2.5164
49	72.18	5:3 4:1	091 098	.5549	22'34'6 : 22'3'46 : 233'4	1.2191	1.1666
50	72.81	4:1	056 060	.5676	233'4' : 2344'	0.9376	0.9926
51	73.25	6:4 5:3	155 084	.5666	22'44'66' : 22'33'6: 22'358'	3.1404	2.9579
52	73.49	5:3	089	.5779	22'346'	0.0000	0.0000
53	73.66	5:2	101 090	.5814	22'34'5 : 22'455'	0.2368	7.0012
54	74.07	5:2	099	.5888	22'44'5	4.1290	3.9115
55	74.59	6:4 5:2	150 112	.5969	22'34'66' : 233'56 : 23'44'6	0.2508	0.2448
56	74.8	5:2	083 109	.6029	22'33'5 : 233'46	0.6844	0.6482
57	75.21	6:4 5:2	152 097	.6062	22'3566' : 22'345 : 22'3'45	2.0917	1.9781
58	75.5	5:2	087 111	.6175	22'345' : 233'55' : 2344'6	2.7234	2.5794
59	75.8	5:2	085 116	.6224	22'344' : 234567	1.1893	1.1264
60	76.13	6:4	136	.6257	22'33'66'	0.0000	0.0000
61	76.3	4:0 5:2	077 110	.6295	33'44' : 233'4'6	0.9608	0.4070
62	76.7	6:3	154	.6349	22'44'56'	0.1145	0.0981
63	77	5:2	082	.6453	22'33'4	0.6990	0.6620
64	77.5	6:3	151	.6499	22'355'6	0.7639	0.6543
65	77.7	6:3 5:1	135 124	.6564	22'33'56' : 2'344'5	0.9372	0.8264
66	77.9	6:3	144	.6584	22'345'6	0.0000	0.0000
67	78	5:1 6:3	107 108	.6620	233'4'5 : 233'45' : 22'34'56	0.8370	0.7682
68	78.3	5:1	123	.6658	2'344'5	12.2911	11.6412
69	78.41	6:3 5:1	149 118	.6672	22'34'5'6 : 23'44'5 : 233'45	0.0000	0.0000
70	78.7	6:3	139 140	.6787	22'344'6 : 22'344'6'	0.0062	0.0058
71	79.2	6:3 5:1	134 143	.6796	22'33'56' : 22'3456': 2344'5	0.5780	0.5293
72	79.4	5:1 6:3	122 131	.6871	2'33'45: 22'33'46:22'33'55'+	0.2160	0.1963
73	79.9	6:2	146 161	.6955	22'34'55' : 233'45'6	0.7468	0.6397
74	80.3	6:3 5:1	132 105	.7035	22'33'46' : 233'44'	2.2184	2.0786
75	80.7	6:2	153	.7036	22'44'55'	0.0123	0.0106
76	81.3	6:2	168	.7068	23'44'5'6	0.0000	0.0000
77	81.5	6:2	141	.7204	22'3455'	0.6479	0.5549
78	81.7	7:4	179	.7205	22'33'566'	0.0000	0.0000
79	82	6:2	130	.7284	22'33'45'	0.6563	0.5622
80	82.2	6:2	137	.7329	22'344'5	0.6102	0.5227
81	82.35	7:4	176	.7385	22'33'466'	0.0000	0.0000
82	82.7	6:2	138 163	.7403	22'344'5' : 233'4'56 : +2	6.4902	5.5663
83	83	6:2	158	.7429	233'44'6	0.8310	0.7118
84	83.4	6:2	129	.7501	22'33'45	0.5521	0.4729
85	83.9	7:3	178	.7537	22'33'55'6	0.0025	0.0045
86	84.25	6:2	166	.7572	2344'56	0.0000	0.0000
87	84.5	7:3	175	.7611	22'33'45'6	0.0342	0.0268
88	84.7	7:3	187 182	.7658	22'34'55'6 : 22'344'56'	0.2757	0.2156
89	85.1	6:2	128	.7761	22'33'44'	1.2071	1.0340
90	85.4	7:3	183	.7720	22'344'5'6	0.0000	0.0000
91	85.7	6:1	167	.7816	23'44'55'	0.5820	0.4986
92	86.3	7:3	185	.7840	22'3455'6	0.0399	0.0313
93	87	7:3	174 181	.7969	22'33'456' : 22'344'56	0.2914	0.2285
94	87.5	7:3	177	.8031	22'33'4'56	0.2156	0.1690
95	87.9	7:3 6:1	171 156	.8109	22'33'44'6 : 233'44'5	0.9068	0.7551
96	88.4	8:4	202	.8099	22'33'55'66'	0.1175	0.0845
97	88.55	6:1	157	.8104	233'44'5'	0.0000	0.0000
98	88.91	7:3	173	.8152	22'33'456	0.0000	0.0000
99	89.3	8:4	200 204	.8197	22'33'45'66' : 22'344'566'	0.0047	0.0034
100	89.6	7:2	172 192	.8270	22'33'455' : 233'455'6	0.1072	0.0838
101	90.2	8:4	197	.8293	22'33'44'66'	0.0000	0.0000
102	90.4	7:2	180	.8362	22'344'55'	0.6200	0.4911
103	90.91	7:2	193	.8397	233'4'55'6	0.0000	0.0000
104	91.3	7:2	191	.8447	233'44'5'6	0.0132	0.0103
105	92.1	8:4	199	.8496	22'33'4566'	0.0398	0.0284
106	93.8	7:2	170	.8746	22'33'44'5	0.4055	0.3172
107	94.3	7:2	190	.8748	233'44'56	0.1064	0.0832
108	95.4	8:3	198	.8849	22'33'455'6	0.0030	0.0022
109	95.99	8:3	201	.8875	22'33'4'55'6	0.0000	0.0000
110	96.7	8:3	196 203	.8939	22'33'44'5'6 : 22'344'55'6	0.0076	0.0058
111	98.6	7:1	189	.9142	233'44'55'	0.0179	0.0136
112	101.1	8:3	195	.9321	22'33'44'56	0.0463	0.0333
113	101.7	9:4	208	.9328	22'33'455'66'	0.0056	0.0037
114	103.29	9:4	207	.9423	22'33'44'566'	0.0000	0.0000
115	105.2	8:2	194	.9620	22'33'44'55'	0.0819	0.0589
116	106.2	8:2	205	.9678	233'44'55'6	0.0023	0.0017
117	114.1	9:3	206	1.018	22'33'44'55'6	0.0649	0.0430
118	126.35	10:4	209	1.054	22'33'44'55'66'	0.0000	0.0000

probably Cl_5-naphthalenes

CONCENTRATION = 2.215815
TOTAL MICROMOLES = 0.0072

AVERAGE MOLECULAR WEIGHT = 309.14153
[illegible]

N.B.
18B



19.727
20.068
21.057
21.507
22.420
23.219
23.514
23.999
24.271
24.611
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25.907
26.474
26.746
27.114
27.925
29.520
29.804
30.328
30.624
31.083
31.452
31.744
32.002
32.289
32.568
32.928
33.171
33.659
34.049
34.367
34.676
34.978
35.344
35.662
35.943
36.312
36.948
37.443
38.172
38.653 int. std.
39.132
39.387
40.740
41.761
42.026
44.178
peaks ident. as Trichloronaphthalenes by mass spec.
7
10
14,15
17
21,22
31,32
57,38
39
46, 47, 48
53
58
61
69
74,75
82
89
95
102
106
109
110
? 111
112
113
115
117

MT32:NB18B.RES

N.B. 18B

PEAK#	RET. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.64	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.72	1:1	001	.1544	2	0.0000	0.0000
3	50.21	1:0	002	.1937	3	1.6647	2.0195
4	50.62	1:0	003	.1975	4	0.5130	0.6648
5	52.46	2:2	004 010	.2245	22' : 26	0.0000	0.0000
6	54.71	2:1	007 009	.2566	24 : 25	0.0399	0.0572
7	55.59	2:1	006	.2709	23'	0.0407	0.0503
8	56.08	2:1	005 008	.2785	23 : 24'	0.0960	0.1375
9	57.34	2:0	014	.2975	35	0.5300	0.7719
10	57.78	3:3	019	.3045	22'6	1.5036	1.8662
11	58.84	3:2	030	.3165	246	0.0069	0.0086
12	59.28	2:0	011	.3238	35'	— R 0.5043 —	— 0.7224
13	59.41	2:0	012 013	.3297	34 : 34'	0.0096	0.1204
14	59.8	3:2 2:0	018 015	.3387	22'5 : 44'	0.4954	0.6406
15	60.05	3:2	017	.3398	22'4	0.2315	0.2874
16	60.70	3:2	024 027	.3500	236 : 23'6	0.2293	0.2046
17	61.35	3:2	016 032	.3625	22'3 : 24'6	0.2163	0.2604
18	62.1	3:1	023	.3770	235	0.0113	0.0141
19	62.31	3:1 4:4	034 054	.3800	2'35 : 22'66'	0.0000	0.0000
20	62.78	3:1	029	.3820	245	0.0000	0.0000
21	62.90	3:1	026	.3911	23'5	0.3986	0.4947
22	63.19	3:1	025	.3937	23'4	0.2092	0.2596
23	63.63	3:1	031	.4024	24'5	0.5400	0.6802
24	63.73	3:1 4:3	028 050	.4031	244' : 22'46	0.7541	0.9335
25	64.51	3:1 4:3	021 033	.4170	233' : 234 : 22'56'	0.4590	0.5146
26	65	3:1 4:3	022 051	.4267	234' : 22'46'	0.2279	0.2605
27	65.49	4:3	045	.4334	22'36	0.1122	0.1220
28	65.84	3:1	036	.4379	33'5	0.0000	0.0000
29	66.06	4:3	046	.4450	22'36'	0.1457	0.1595
30	66.45	3:1	039	.4480	34'5	0.0000	0.0000
31	66.65	4:2	052 073	.4554	22'55' : 23'5'6	4.1409	4.5410
32	66.97	4:2	049	.4610	22'45	2.3400	2.5700
33	67.25	4:2	047	.4639	22'44'	0.9249	1.0123
34	67.35	4:2	048 075	.4651	22'45 : 244'6	0.3027	0.3313
35	67.51	4:2	065 062	.4865	2346 : 2356	0.0796	0.0071
36	67.87	3:0	035	.4730	33'4	0.0000	0.0000
37	68.16	5:4 4:2	104 044	.4832	22'466' : 22'35'	1.7602	1.9331
38	68.44	3:0 4:2	037 042	.4870	344' : 22'34' : 233'6	0.9559	1.0550
39	69.14	4:2	064 071	.4990	23'34 : 234'6 : 23'4'6 +	0.0777	0.9606
40	69.25	4:1	068	.5040	23'45' 7	0.0000	0.0000
41	69.4	5:4	096	.5057	22'366'	0.1447	0.1417
42	69.68	4:2	040	.5102	22'33'	0.2520	0.2540
43	70.1	5:3 4:1	103 057	.5155	22'45'6 : 233'5	0.1691	0.1000
44	70.46	5:3 4:1	100 067	.5212	22'44'6 : 23'4'5	0.2005	0.2049
45	70.79	4:1	058 063	.5267	233'5' : 234'5	0.1106	0.1290
46	71.15	4:1 5:3	074 095	.5340	244'5 : 22'356'	0.0101	0.0279
47	71.36	4:1	070 061	.5407	23'4'5 : 2'345 : 23457	3.2057	3.5006
48	71.75	4:1 5:3	066 095	.5447	23'44' : 22'356 : 22'35'6	4.2010	4.1340
49	72.19	5:3 4:1	091 098	.5549	22'34'6 : 22'3'46 : 233'4	1.1904	1.1056
50	72.81	4:1	056 060	.5676	233'4' : 2344'	0.7977	0.0751
51	73.25	6:4 5:3	155 084	.5666	22'44'66' : 22'33'6: 22'355'	2.9545	2.0769
52	73.49	5:3	089	.5779	22'346'	0.0000	0.0000
53	73.69	5:2	101 090	.5814	22'34'5 : 22'455'	7.7900	7.6355
54	74.08	5:2	099	.5800	22'44'5	4.1910	4.1044
55	74.6	6:4 5:2	150 112	.5969	22'34'66' : 233'56 : 23'44'6	0.2698	0.2639
56	74.8	5:2	083 109	.6029	22'33'5 : 233'46	0.6406	0.6390
57	75.22	6:4 5:2	152 097	.6062	22'3566' : 22'345 : 22'3'45	1.9166	1.0663
58	75.55	5:2	087 111	.6175	22'345' : 233'55' : 2344'6	2.1102	2.0662
59	75.86	5:2	085 116	.6224	22'344' : 234567	0.9903	0.9696
60	76.1	6:4	136	.6257	22'33'66'	0.6173	0.5467
61	76.3	4:0 5:2	077 110	.6295	33'44' : 233'4'6	0.2012	0.1006
62	76.7	6:3	154	.6349	22'44'56'	0.0060	0.0769
63	77	5:2	082	.6453	22'33'4	0.5470	0.5354
64	77.5	6:3	151	.6499	22'355'6	0.7239	0.6411
65	77.7	6:3 5:1	135 124	.6563	22'33'56' : 2'344'5	0.0514	0.7762
66	77.9	6:3	144	.6584	22'345'6	0.0000	0.0000
67	78	5:1 6:3	107 180	.6628	233'4'5 : 233'45' : 22'34'56	0.0066	0.7653
68	78.25	5:1	123	.6658	2'344'5	0.0000	0.0000
69	78.4	6:3 5:1	149 118	.6674	22'34'5'6 : 23'44'5 : 233'45	10.4354	9.5152
70	78.8	6:3	139 140	.6707	22'344'6 : 22'344'6'	0.0059	0.0052
71	79.1	6:3 5:1	134 143	.6796	22'33'56' : 22'3456' : 2344'5	0.4994	0.4707
72	79.5	5:1 6:3	122 131	.6871	2'33'45: 22'33'46:22'33'55'+	0.1905	0.1709
73	79.9	6:2	146 161	.6955	22'34'55' : 233'45'6	0.7070	0.6260
74	80.3	6:3 5:1	132 105	.7035	22'33'46' : 233'44'	1.0592	1.0009
75	80.5	6:2	153	.7036	22'44'55'	7.9606	7.0566
76	81.3	6:2	160	.7068	23'44'5'6	0.0184	0.0163
77	81.5	6:2	141	.7203	22'3455'	0.5650	0.5001
78	81.7	7:4	179	.7205	22'33'566'	0.0000	0.0000
79	82	6:2	130	.7204	22'33'45'	0.6044	0.5352
80	82.2	6:2	137	.7329	22'344'5	0.5210	0.4621
81	82.35	7:4	176	.7305	22'33'466'	0.0000	0.0000
82	82.7	6:2	138 163	.7403	22'344'5' : 233'4'56 : +2	5.9107	5.2343
83	83	6:2	158	.7429	233'44'6	0.7569	0.6703
84	83.4	6:2	129	.7501	22'33'45	0.4875	0.4517
85	83.9	7:3	178	.7537	22'33'55'6	0.0702	0.0632
86	84.25	6:2	166	.7572	2344'56	0.0000	0.0000
87	84.4	7:3	175	.7611	22'33'45'6	0.0000	0.0000
88	84.7	7:3	187 182	.7653	22'34'55'6 : 22'344'56'	0.2613	0.2112
89	85.1	6:2	128	.7761	22'33'44'	1.1047	0.9703
90	85.4	7:3	183	.7720	22'344'5'6	0.0000	0.0000
91	85.7	6:1	167	.7814	23'44'55'	0.5709	0.5056
92	86.3	7:3	185	.7840	22'3455'6	0.0378	0.0307
93	87	7:3	174 181	.7965	22'33'456' : 22'344'56	0.2762	0.2230
94	87.5	7:3	177	.8031	22'33'4'56	0.2043	0.1656
95	88	7:3 6:1	171 156	.8105	22'33'44'6 : 233'44'5	0.0309	0.7222
96	88.44	8:4	202	.8089	22'33'55'66'	0.0000	0.0000
97	88.5	6:1	157	.8184	233'44'5'	0.1058	0.0934
98	88.8	7:3	173	.8152	22'33'456	0.0076	0.0061
99	89.3	8:4	200 204	.8197	22'33'45'66' : 22'344'566'	0.0045	0.0033
100	89.6	7:2	172 192	.8278	22'33'455' : 233'455'6	0.1161	0.0939
101	90.2	8:4	197	.8293	22'33'44'66'	0.0000	0.0000
102	90.4	7:2	180	.8362	22'344'55'	0.6205	0.5016
103	90.8	7:2	193	.8597	233'4'55'6	0.0262	0.0212
104	91.3	7:2	191	.8447	233'44'5'6	0.0167	0.0135
105	92.2	8:4	199	.8494	22'33'4566'	0.0535	0.0390
106	93.8	7:2	170	.8740	22'33'44'5	0.3990	0.3286
107	94.3	7:2	190	.8740	233'44'56	0.1045	0.0845
108	95.5	8:3	198	.8845	22'33'455'6	0.0084	0.0064
109	95.9	8:3	201	.8875	22'33'4'55'6	0.0710	0.0534
110	96.8	8:3	196 203	.8935	22'33'44'5'6 : 22'344'55'6	0.0063	0.0642
111	98.6	7:1	189	.9142	233'44'55'	0.0165	0.0133
112	101.23	8:3	195	.9321	22'33'44'56	0.0000	0.0000
113	101.7	9:4	208	.9320	22'33'455'66'	0.0000	0.0000
114	103.6	9:4	207	.9423	22'33'44'566'	0.0000	0.0000
115	105.3	8:2	194	.9620	22'33'44'55'	0.0836	0.0622
116	106.77	8:2	205	.9678	233'44'55'6	0.0000	0.0000
117	114.2	9:3	206	1.010	22'33'44'55'6	0.0612	0.0421
118	126.35	10:4	209	1.050	22'33'44'55'66'	0.0000	0.0000

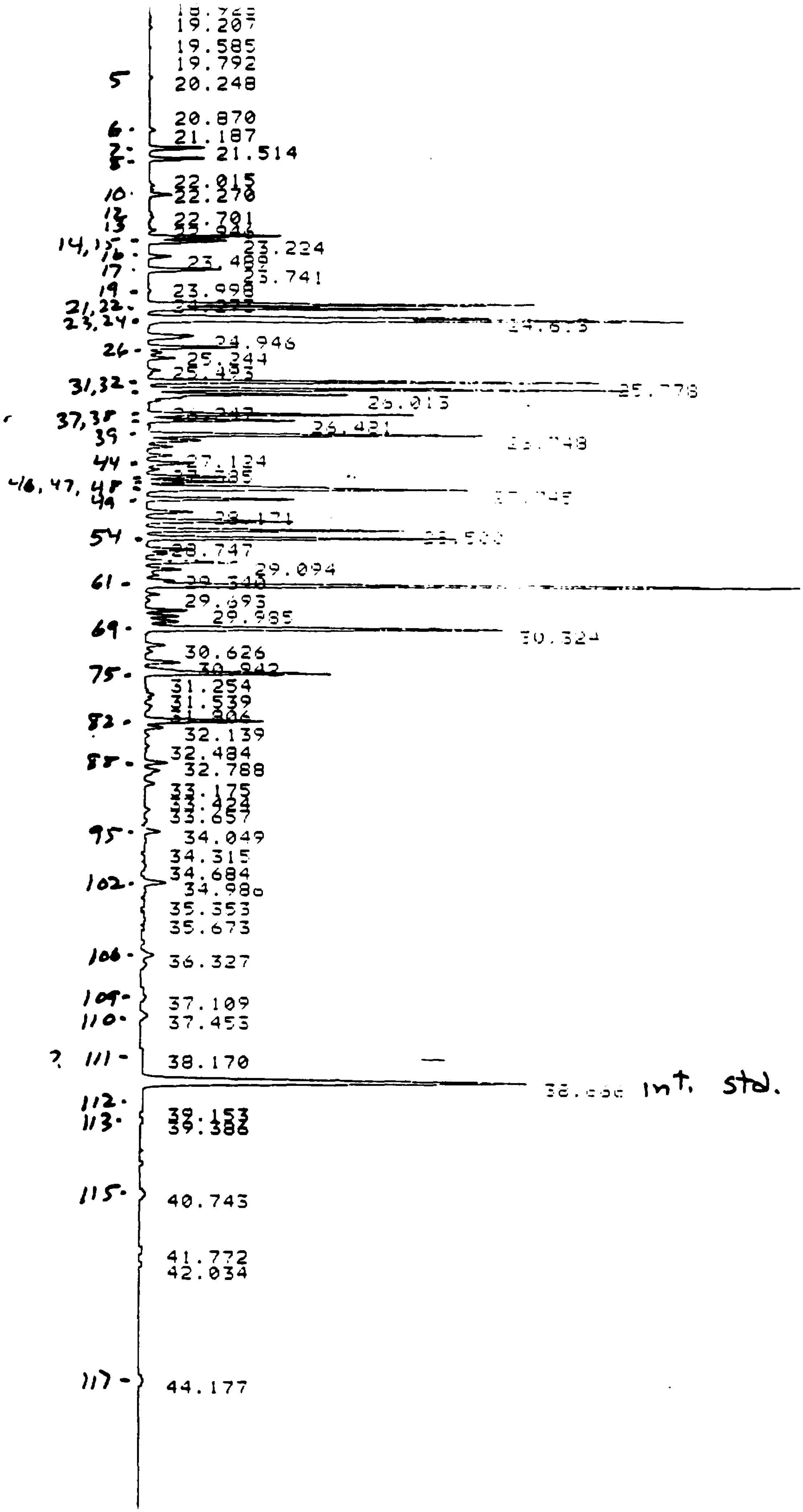
Ident. as -Trichloronaphthalene by M.S.

CONCENTRATION = 2.560455
TOTAL MICROMOLES = 0.0000

AVERAGE MOLECULAR WEIGHT = 319.5900
NUMBER OF CALIBRATED PEAKS FOUND = 118

N. B.

19A



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35.673
36.327
37.109
37.453
38.170
int. std.
39.153
39.386
40.743
41.772
42.034
44.177

N.B. 19A

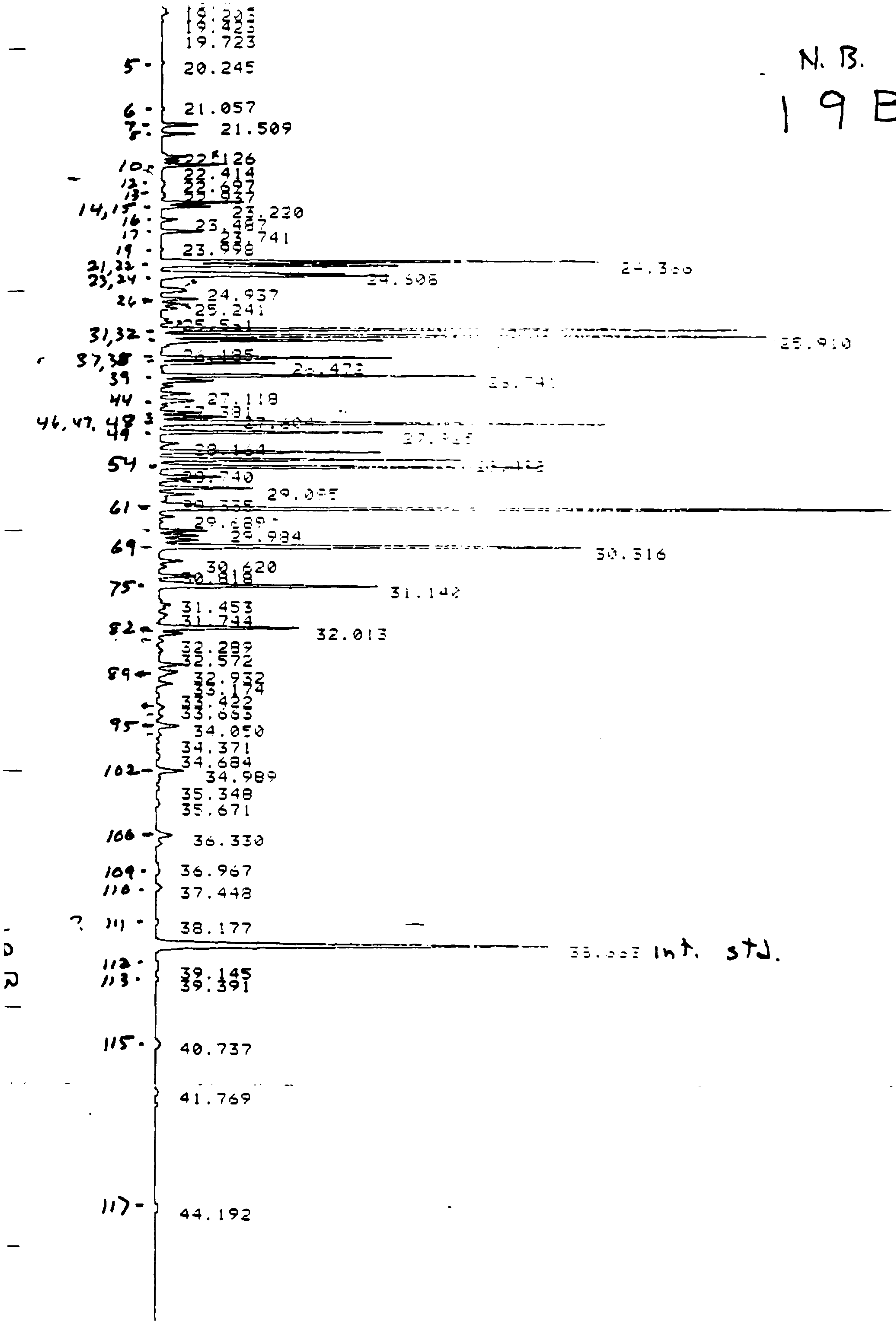
PEAK#	RET. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.63	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.72	1:1	001	.1544	2	0.0000	0.0000
3	50.22	1:0	002	.1937	3	1.9583	1.4680
4	50.61	1:0	003	.1975	4	0.2953	0.4524
5	52.31	2:2	004 010	.2245	22' : 26	0.4920	0.6375
6	54.75	2:1	007 009	.2566	24 : 25	0.2182	0.2827
7	55.6	2:1	006	.2709	23'	1.8281	2.3688
8	56.89	2:1	005 008	.2785	23 : 24'	1.5362	1.9906
9	57.33	2:0	014	.2973	35	0.2032	0.2634
10	57.77	3:3	019	.3045	22'6	0.9043	1.0152
11	58.83	3:2	030	.3165	246	0.0675	0.0758
12	59.6	2:0	011	.3238	33'	0.2178	0.2822
13	59.95	2:0	012 013	.3297	34 : 34'	0.3784	0.4903
14	59.81	3:2 2:0	018 015	.3387	22'5 : 44'	4.1293	4.8293
15	60.02	4:2	017	.3398	22'4	2.2247	2.4975
16	60.69	3:2	024 027	.3508	236 : 23'6	0.4200	0.4715
17	61.34	3:2	016 032	.3625	22'3 : 24'6	1.3073	1.4677
18	62.01	3:1	023	.3770	235	0.0261	0.0293
19	62.32	3:1 4:4	034 054	.3800	2'35 : 22'66'	0.0572	0.0610
20	62.78	3:1	029	.3820	245	0.0000	0.0000
21	62.99	3:1	026	.3911	23'5	4.5787	5.1403
22	63.10	3:1	025	.3937	23'4	3.6981	4.1516
23	63.62	3:1	031	.4024	24'5	4.2764	4.8009
24	63.72	3:1 4:3	028 050	.4031	244' : 22'46	4.9398	5.5309
25	64.47	3:1 4:3	021 053	.4170	233' : 234 : 22'56'	1.0062	1.0202
26	65.01	3:1 4:3	022 051	.4267	234' : 22'46'	0.8032	0.8559
27	65.5	4:3	045	.4334	22'36	0.4845	0.4796
28	65.89	3:1	036	.4379	33'5	0.0110	0.0124
29	66.07	4:3	046	.4450	22'36'	0.3835	0.3797
30	66.45	3:1	039	.4480	34'5	0.0000	0.0000
31	66.61	4:2	052 073	.4554	22'55' : 23'5'6	7.7312	7.6540
32	66.98	4:2	049	.4610	22'45	6.1607	6.0991
33	67.24	4:2	047	.4639	22'44'	2.4523	2.4278
34	67.34	4:2	048 075	.4651	22'45 : 244'6	0.4356	0.4312
35	67.52	4:2	065 062	.4865	2346 : 2356	0.0884	0.0875
36	67.83	3:0	035	.4738	33'4	0.0689	0.0683
37	68.17	5:4 4:2	104 044	.4832	22'466' : 22'35'	2.8284	2.7969
38	68.45	3:0 4:2	037 042	.4870	344' : 22'34' : 234'6	2.2997	2.2957
39	69.12	4:2	064 071	.4990	23'34 : 234'6 : 23'4'6 +	2.5872	2.5614
40	69.25	4:1	068	.5040	23'45' 7	0.0000	0.0000
41	69.56	5:4	096	.5057	22'366'	1.3821	1.1532
42	69.69	4:2	040	.5102	22'33'	0.3053	0.3023
43	70.11	5:3 4:1	103 057	.5155	22'45'6 : 233'5	0.3515	0.3399
44	70.47	5:3 4:1	100 067	.5212	22'44'6 : 23'4'5	0.8410	0.7774
45	70.78	4:1	058 063	.5267	233'5' : 234'5	0.1462	0.1448
46	71.11	4:1 5:3	074 094	.5340	244'5 : 22'356'	0.7800	0.7218
47	71.35	4:1	070 061	.5407	23'4'5 : 2'345 : 23457	0.0649	0.0562
48	71.71	4:1 5:3	066 095	.5447	23'44' : 2,'356 : 22'35'6	4.1571	3.7002
49	72.17	5:3 4:1	091 090	.5549	22'34'6 : 22'3'46 : 258'4	1.9108	1.7099
50	72.82	4:1	056 060	.5676	233'4' : 2344'	0.5264	0.5211
51	73.24	6:4 5:3	155 084	.5666	22'44'66' : 22'33'6: 22'355'	1.8003	1.5057
52	73.49	5:3	089	.5779	22'346'	0.0000	0.0000
53	73.67	5:2	101 090	.5814	22'34'5 : 22'455'	2.8799	2.5688
54	74.04	5:2	099	.5880	22'44'5	3.3200	2.9484
55	74.61	6:4 5:2	150 112	.5969	22'34'66' : 233'56 : 23'44'6	0.4654	0.4122
56	74.79	5:2	083 109	.6029	22'33'5 : 233'46	0.3674	0.3254
57	75.2	6:4 5:2	152 097	.6062	22'3566' : 22'345 : 22'3'45	0.8730	0.7689
58	75.54	5:2	087 111	.6175	22'345' : 233'55' : 2344'6	0.2411	0.2135
59	75.82	5:2	085 116	.6224	22'344' : 234567	0.0763	0.0676
60	76.08	6:4	136	.6257	22'33'66'	0.4455	0.3569
61	76.29	4:0 5:2	077 110	.6295	33'44' : 233'4'6	4.5406	4.0215
62	76.75	6:3	154	.6349	22'44'56'	0.1499	0.1200
63	77.04	5:2	082	.6453	22'33'4	0.8433	0.8304
64	77.5	6:3	151	.6499	22'355'6	0.4862	0.3894
65	77.76	6:3 5:1	135 124	.6565	22'33'56' : 2'344'5	0.3632	0.2995
66	77.9	6:3	144	.6584	22'345'6	0.0000	0.0000
67	78.02	5:1 6:3	107 108	.6628	233'4'5 : 233'45' : 22'34'56	0.4608	0.3952
68	78.25	5:1	123	.6658	2'344'5	0.0000	0.0000
69	78.38	6:3 5:1	149 118	.6672	22'34'5'6 : 23'44'5 : 233'45	3.9903	3.2978
70	78.55	6:3	139 140	.6707	22'344'6 : 22'344'6'	0.0000	0.0000
71	79.16	6:3 5:1	134 143	.6796	22'33'56' : 22'3456': 2344'5	0.2327	0.2018
72	79.47	5:1 6:3	122 131	.6871	2'33'45: 22'33'46:22'33'58'+	0.0822	0.0699
73	79.98	6:2	146 161	.6955	22'34'55' : 233'45'6	0.4312	0.3454
74	80.35	6:3 5:1	132 105	.7039	22'33'46' : 233'44'	0.0000	0.0000
75	80.5	6:2	153	.7036	22'44'55'	4.3908	3.5235
76	81.3	6:2	168	.7068	23'44'5'6	0.0148	0.0119
77	81.51	6:2	141	.7203	22'3455'	0.0531	0.0425
78	81.72	7:4	179	.7205	22'33'566'	0.1169	0.0855
79	82.05	6:2	130	.7284	22'33'45'	0.0946	0.0758
80	82.21	6:2	137	.7329	22'344'5	0.0731	0.0585
81	82.35	7:4	176	.7365	22'33'466'	0.0000	0.0000
82	82.75	6:2	138 163	.7403	22'344'5' : 233'4'56 : +2	1.0118	0.8105
83	83.06	6:2	158	.7429	233'44'6	0.1662	0.1332
84	83.48	6:2	129	.7501	22'33'45	0.0547	0.0439
85	83.97	7:3	178	.7537	22'33'55'6	0.0450	0.0329
86	84.2	6:2	166	.7572	2344'56	0.0102	0.0082
87	84.4	7:3	175	.7611	22'33'45'6	0.0000	0.0000
88	84.74	7:3	187 182	.7653	22'34'55'6 : 22'344'56'	0.2256	0.1650
89	85.1	6:2	128	.7761	22'33'44'	0.1129	0.0904
90	85.4	7:3	183	.7720	22'344'5'6	0.0000	0.0000
91	85.7	6:1	167	.7814	23'44'55'	0.2451	0.1963
92	86.3	7:3	185	.7848	22'3455'6	0.0109	0.0080
93	86.9	7:3	174 181	.7965	22'33'456' : 22'344'56	0.0644	0.0472
94	87.5	7:3	177	.8031	22'33'4'56	0.0446	0.0320
95	88	7:3 6:1	171 156	.8105	22'33'44'6 : 233'44'5	0.1602	0.1247
96	88.44	8:4	202	.8089	22'33'55'66'	0.0000	0.0000
97	88.55	6:1	157	.8184	233'44'5'	0.0000	0.0000
98	88.91	7:3	173	.8152	22'33'456	0.0000	0.0000
99	89.36	8:4	200 204	.8197	22'33'45'66' : 22'344'566'	0.0000	0.0000
100	89.6	7:2	172 192	.8278	22'33'455' : 233'455'6	0.0334	0.0244
101	90.2	8:4	197	.8293	22'33'44'66'	0.0000	0.0000
102	90.4	7:2	180	.8362	22'344'55'	0.1840	0.1346
103	90.8	7:2	193	.8397	233'4'55'6	0.0126	0.0092
104	91.44	7:2	191	.8447	233'44'5'6	0.0000	0.0000
105	92.1	8:4	199	.8494	22'33'4566'	0.0106	0.0073
106	93.9	7:2	170	.8748	22'33'44'5	0.1047	0.0766
107	94.3	7:2	190	.8748	233'44'56	0.0456	0.0334
108	95.63	8:3	198	.8845	22'33'455'6	0.0000	0.0000
109	95.9	8:3	201	.8875	22'33'4'55'6	0.0367	0.0247
110	96.8	8:3	196 203	.8935	22'33'44'5'6 : 22'344'55'6	0.0592	0.0398
111	98.72	7:1	189	.9142	233'44'55'	0.0000	0.0000
112	101.1	8:3	195	.9321	22'33'44'56	0.0105	0.0071
113	101.87	9:4	208	.9328	22'33'455'66'	0.0000	0.0000
114	103.29	9:4	207	.9423	22'33'44'566'	0.0000	0.0000
115	105.3	8:2	194	.9628	22'33'44'55'	0.0464	0.0312
116	106.77	8:2	205	.9678	233'44'55'6	0.0000	0.0000
117	114.24	9:3	206	1.010	22'33'44'55'6	0.0000	0.0000
118	126.35	10:4	209	1.058	22'33'44'55'66'	0.0000	0.0000

CONCENTRATION = 3.084791
TOTAL MICROMOLES = 0.0104

AVERAGE MOLECULAR WEIGHT = 289.08233
NUMBER OF CALIBRATED PEAKS FOUND = 118

N. B.

19 B



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MT32:NB19B.RES

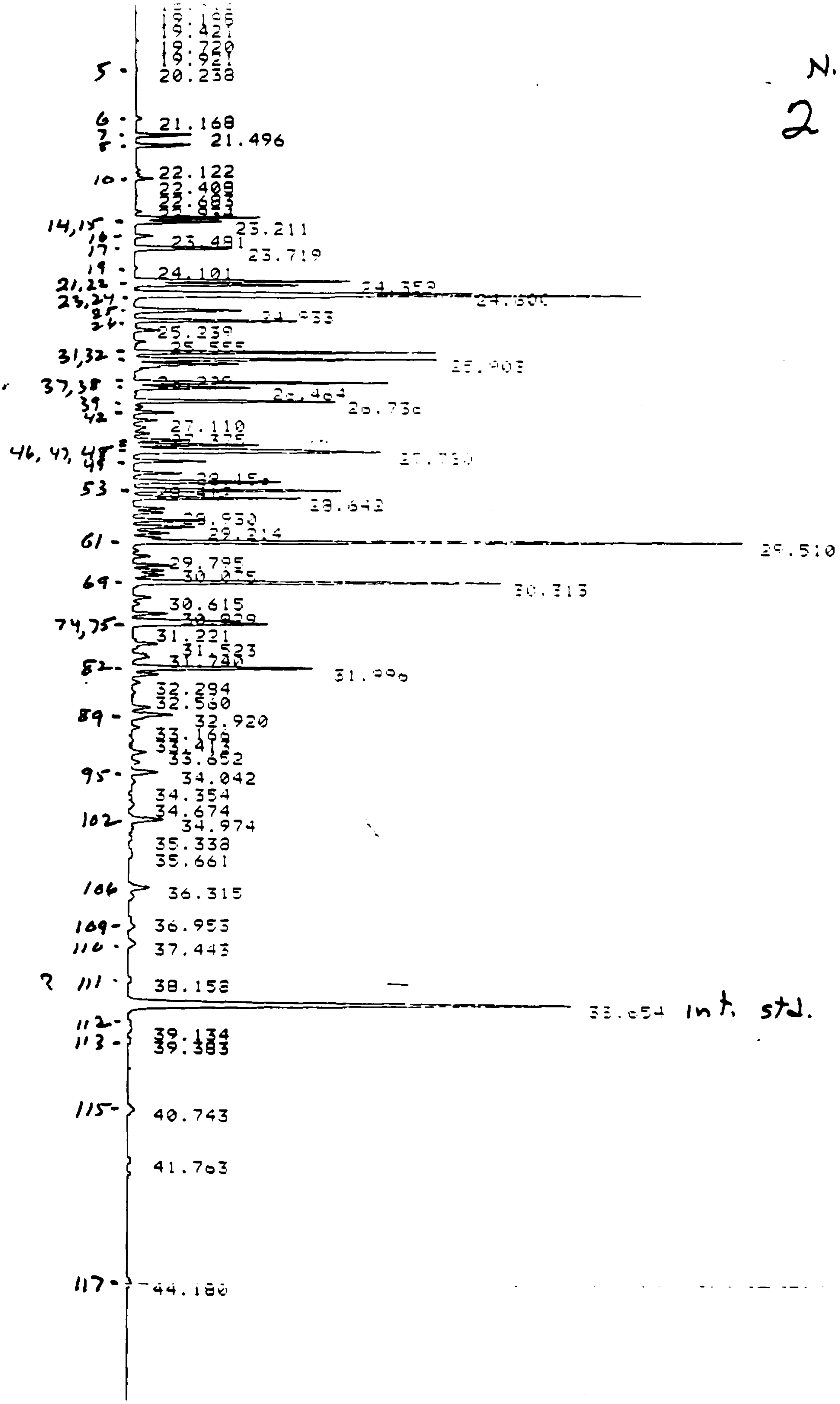
NB 19B

PEAK#	RET. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.64	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.61	1:1	001	.1544	2	0.1210	0.1067
3	50.10	1:0	002	.1937	3	3.1799	4.9054
4	50.62	1:0	003	.1975	4	0.1633	0.2519
5	52.33	2:2	004 010	.2245	22' : 26	0.4354	0.5601
6	54.73	2:1	007 009	.2566	24 : 25	0.1143	0.1491
7	55.59	2:1	006	.2709	23'	1.1277	1.4715
8	56.08	2:1	005 008	.2785	23 : 24'	0.8924	1.1645
9	57.53	2:0	014	.2973	35	0.4614	0.6021
10	57.78	3:3	019	.3045	22'6	2.2570	2.5525
11	58.82	3:2	030	.3165	246	0.0615	0.0695
12	59.03	2:0	011	.3238	33'	0.2400	0.3143
13	59.47	2:0	012 013	.3297	34 : 34'	0.2283	0.2979
14	59.8	3:2 2:0	018 015	.3387	22'5 : 44'	2.5374	2.9085
15	60.01	3:2	017	.3390	22'4	1.2360	1.3974
16	60.71	3:2	024 027	.3500	236 : 23'6	0.2787	0.3151
17	61.30	3:2	016 032	.3625	22'3 : 24'6	0.7011	0.7926
18	62.1	3:1	023	.3770	235	0.0072	0.0082
19	62.34	3:1 4:4	034 054	.3800	2'35 : 22'66'	0.0475	0.0516
20	62.78	3:1	029	.3820	245	0.0000	0.0000
21	62.98	3:1	026	.3911	23'5	5.3529	6.0518
22	63.19	3:1	025	.3937	23'4	3.3929	3.0358
23	63.6	3:1	031	.4024	24'5	2.0161	2.2793
24	63.73	3:1 4:3	028 050	.4031	244' : 22'46	2.1328	2.4048
25	64.46	3:1 4:3	021 033	.4170	233' : 234 : 22'56'	0.2504	0.2640
26	65	3:1 4:3	022 051	.4267	234' : 22'46'	0.3221	0.3456
27	65.49	4:3	045	.4334	22'36	0.2786	0.2778
28	65.73	3:1	036	.4379	33'5	0.0000	0.0000
29	66.09	4:3	046	.4450	22'36'	0.2784	0.2776
30	66.45	3:1	039	.4480	34'5	0.0000	0.0000
31	66.63	4:2	052 073	.4554	22'55' : 23'5'6	9.8363	9.8066
32	66.97	4:2	049	.4610	22'45	7.7913	7.7677
33	67.23	4:2	047	.4639	22'44'	2.9743	2.9653
34	67.41	4:2	048 075	.4651	22'45 : 244'6	0.0000	0.0000
35	67.51	4:2	065 062	.4665	2346 : 2356	0.0680	0.0686
36	67.87	3:0	035	.4738	33'4	0.0000	0.0000
37	68.16	5:4 4:2	104 044	.4832	22'466' : 22'35'	2.4518	2.4407
38	68.44	3:0 4:2	037 042	.4870	344' : 22'34' : 233'6	1.6467	1.6554
39	69.11	4:2	064 071	.4990	23'34 : 234'6 : 23'4'6 +	2.2644	2.2575
40	69.25	4:1	068	.5040	23'45' ?	0.0000	0.0000
41	69.4	5:4	096	.5057	22'366'	1.2561	1.1203
42	69.68	4:2	040	.5102	22'33'	0.1425	0.1420
43	70.1	5:3 4:1	103 057	.5155	22'45'6 : 233'5	0.4127	0.4020
44	70.48	5:3 4:1	100 067	.5212	22'44'6 : 23'4'5	0.7052	0.6566
45	70.79	4:1	058 063	.5267	233'5' : 234'5	0.0917	0.0914
46	71.23	4:1 5:3	074 094	.5340	244'5 : 22'356'	0.3639	0.3380
47	71.36	4:1	070 061	.5407	23'4'5 : 2345 : 23457	0.7190	0.7177
48	71.73	4:1 5:3	066 095	.5447	23'44' : 22'356 : 22'35'6	4.7901	4.2936
49	72.19	5:3 4:1	091 098	.5549	22'34'6 : 22'3'46 : 233'4	2.5002	2.3251
50	72.81	4:1	056 060	.5676	233'4' : 2344'	0.2230	0.2223
51	73.25	6:4 5:3	155 084	.5666	22'44'66' : 22'33'6: 22'355'	2.3171	2.0552
52	73.49	5:3	089	.5779	22'346'	0.0000	0.0000
53	73.67	5:2	101 090	.5814	22'34'5 : 22'455'	3.2473	2.8962
54	74.05	5:2	099	.5880	22'44'5	3.6995	3.2996
55	74.6	6:4 5:2	150 112	.5969	22'34'66' : 233'56 : 23'44'6	0.5967	0.5322
56	74.8	5:2	083 109	.6029	22'33'5 : 233'46	0.4198	0.3741
57	75.22	6:4 5:2	152 097	.6062	22'3566' : 22'345 : 22'3'45	0.8898	0.7182
58	75.55	5:2	087 111	.6175	22'345' : 233'55' : 2344'6	0.2261	0.2016
59	75.84	5:2	085 116	.6224	22'344' : 234567	0.0660	0.0584
60	76.1	6:4	136	.6257	22'33'66'	0.4987	0.4022
61	76.3	4:0 5:2	077 110	.6295	33'44' : 233'4'6	5.5594	4.9370
62	76.74	6:3	154	.6349	22'44'56'	0.1658	0.1337
63	77	5:2	082	.6453	22'33'4	0.0280	0.0257
64	77.5	6:3	151	.6499	22'355'6	0.5329	0.4299
65	77.7	6:3 5:1	135 124	.6563	22'33'56' : 2'344'5	0.4017	0.3336
66	77.9	6:3	144	.6584	22'345'6	0.0000	0.0000
67	78	5:1 6:3	107 108	.6628	233'4'5 : 233'45' : 22'34'56	0.4923	0.4295
68	78.3	5:1	123	.6650	2'344'5	5.2368	4.6707
69	78.41	6:3 5:1	149 118	.6672	22'34'5'6 : 23'44'5 : 233'45	0.0000	0.0000
70	78.55	6:3	139 140	.6707	22'344'6 : 22'344'6'	0.0000	0.0000
71	79.1	6:3 5:1	134 143	.6796	22'33'56' : 22'3456' : 2344'5	0.2650	0.2314
72	79.4	5:1 6:3	122 131	.6871	2'33'45 : 22'33'46 : 22'33'55'+	0.0909	0.0778
73	79.9	6:2	146 161	.6955	22'34'55' : 233'45'6	0.4638	0.3741
74	80.35	6:3 5:1	132 105	.7035	22'33'46' : 233'44'	0.0000	0.0000
75	80.5	6:2	153	.7036	22'44'55'	4.8686	3.9240
76	81.3	6:2	168	.7068	23'44'5'6	0.0211	0.0170
77	81.5	6:2	141	.7203	22'3455'	0.0606	0.0488
78	81.7	7:4	179	.7205	22'33'566'	0.1180	0.0869
79	82	6:2	130	.7204	22'33'45'	0.1868	0.1507
80	82.2	6:2	137	.7329	22'344'5	0.0000	0.0000
81	82.35	7:4	176	.7305	22'33'466'	0.0000	0.0000
82	82.7	6:2	138 163	.7403	22'344'5' : 233'4'56 : +2	1.1860	0.9567
83	83	6:2	158	.7429	233'44'6	0.2034	0.1640
84	83.4	6:2	129	.7501	22'33'45	0.0643	0.0519
85	83.9	7:3	178	.7537	22'33'55'6	0.0569	0.0419
86	84.2	6:2	166	.7572	2344'56	0.0132	0.0106
87	84.4	7:3	175	.7611	22'33'45'6	0.0000	0.0000
88	84.7	7:3	187 182	.7653	22'34'55'6 : 22'344'56'	0.2311	0.1702
89	85.1	6:2	128	.7761	22'33'44'	0.1852	0.1494
90	85.4	7:3	183	.7720	22'344'5'6	0.0000	0.0000
91	85.7	6:1	167	.7814	23'44'55'	0.2896	0.2336
92	86.8	7:3	185	.7848	22'3455'6	0.0096	0.0071
93	87	7:3	174 181	.7965	22'33'456' : 22'344'56	0.0665	0.0491
94	87.5	7:3	177	.8031	22'33'4'56	0.0496	0.0366
95	88	7:3 6:1	171 156	.8105	22'33'44'6 : 233'44'5	0.2004	0.1635
96	88.4	8:4	202	.8009	22'33'55'66'	0.0256	0.0168
97	88.55	6:1	157	.8184	233'44'5'	0.0000	0.0000
98	88.8	7:3	173	.8152	22'33'456	0.0019	0.0014
99	89.3	8:4	200 204	.8197	22'33'45'66' : 22'344'566'	0.0029	0.0019
100	89.6	7:2	172 192	.8270	22'33'455' : 233'455'6	0.0370	0.0272
101	90.2	8:4	197	.8298	22'33'44'66'	0.0000	0.0000
102	90.4	7:2	180	.8362	22'344'55'	0.2036	0.1499
103	90.8	7:2	193	.8397	233'4'55'6	0.0167	0.0123
104	91.3	7:2	191	.8447	233'44'5'6	0.0066	0.0049
105	92.2	8:4	199	.8494	22'33'4566'	0.0136	0.0092
106	93.9	7:2	170	.8740	22'33'44'5	0.1214	0.0894
107	94.3	7:2	190	.8740	233'44'56	0.0459	0.0338
108	95.6	8:3	198	.8845	22'33'455'6	0.0037	0.0025
109	95.9	8:3	201	.8875	22'33'4'55'6	0.0356	0.0241
110	96.0	8:3	196 203	.8935	22'33'44'5'6 : 22'344'55'6	0.0486	0.0329
111	98.7	7:1	189	.9142	233'44'55'	0.0079	0.0058
112	101.2	8:3	195	.9321	22'33'44'56	0.0209	0.0142
113	101.7	9:4	206	.9320	22'33'455'66'	0.0017	0.0011
114	103.1	9:4	207	.9423	22'33'44'566'	0.0000	0.0000
115	105.3	8:2	194	.9620	22'33'44'55'	0.0418	0.0283
116	106.6	8:2	205	.9670	233'44'55'6	0.0000	0.0000
117	114.3	9:3	206	1.010	22'33'44'55'6	0.0146	0.0092
118	126.35	10:4	209	1.054	22'33'44'55'66'	0.0000	0.0000

CONCENTRATION = 3.327556
TOTAL MICROMOLES = 0.0114

AVERAGE MOLECULAR WEIGHT = 291.11597

N. B.
21 A



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R132:NB21A.RES

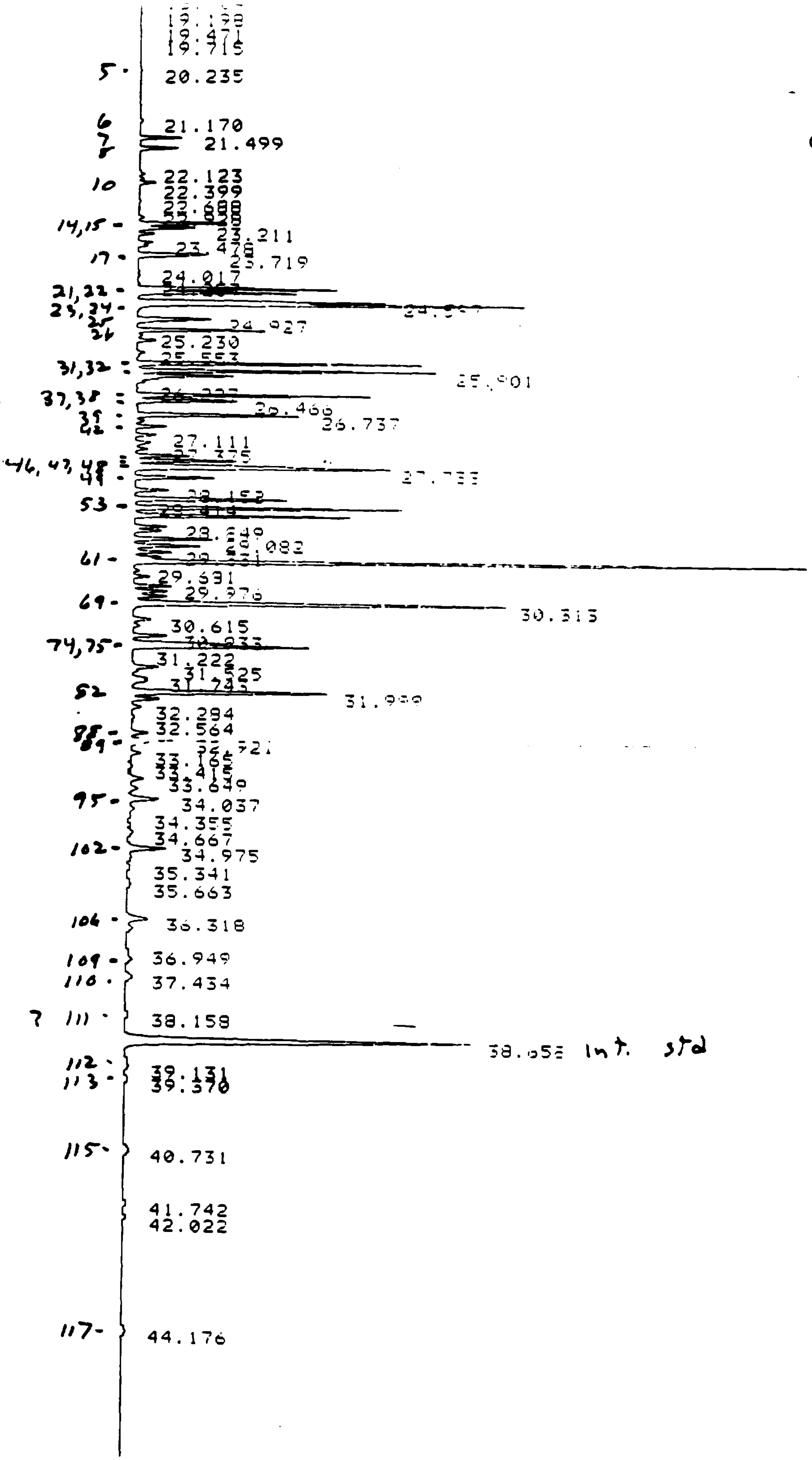
NB. 21A

PEAK#	RET. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.59	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.72	1:1	001	.1544	2	0.0000	0.0000
3	50.06	1:0	002	.1937	3	2.1139	3.2103
4	50.63	1:0	003	.1975	4	0.1629	0.2473
5	52.31	2:2	004 010	.2245	22' ; 26	0.3799	0.4879
6	54.72	2:1	007 009	.2546	24 ; 25	0.2786	0.3579
7	55.57	2:1	006	.2709	23'	2.0054	2.5734
8	56.09	2:1	005 008	.2785	23 ; 24'	1.9016	2.4426
9	57.33	2:0	014	.2973	35	0.1652	0.2122
10	57.75	3:3	019	.3045	22'6	0.7694	0.8563
11	58.63	3:2	030	.3165	246	0.0307	0.0341
12	59.02	2:0	011	.3238	33'	0.3202	0.4113
13	59.46	2:0	012 013	.3297	34 ; 34'	0.3984	0.5118
14	59.79	3:2 2:0	018 015	.3387	22'5 ; 44'	4.0416	5.6132
15	60	3:2	017	.3398	22'4	2.5781	2.8692
16	60.72	3:2	024 027	.3508	236 ; 23'6	0.3905	0.4345
17	61.32	3:2	016 032	.3625	22'3 ; 24'6	2.3349	2.5981
18	62.3	3:1	023	.3770	235	0.0863	0.0960
19	62.43	3:1 4:4	034 054	.3800	2'35 ; 22'66'	0.0000	0.0000
20	62.72	3:1	029	.3820	245	0.0057	0.0063
21	62.97	3:1	026	.3911	23'5	3.5029	3.8983
22	63.18	3:1	025	.3937	23'4	2.8773	3.2021
23	63.59	3:1	031	.4024	24'5	4.6007	5.1201
24	63.72	3:1 4:3	028 050	.4031	244' ; 22'46	5.5045	6.1095
25	64.47	3:1 4:3	021 033	.4178	233' ; 234 ; 22'56'	2.1410	2.1520
26	64.99	3:1 4:3	022 051	.4267	234' ; 22'46'	1.5706	1.6590
27	65.48	4:3	045	.4334	22'36	0.5343	0.5244
28	65.84	3:1	036	.4379	33'5	0.0000	0.0000
29	66.08	4:3	046	.4450	22'36'	0.4098	0.4022
30	66.45	3:1	039	.4488	34'5	0.0000	0.0000
31	66.62	4:2	052 073	.4594	22'55' ; 23'5'6	6.3494	6.2313
32	66.98	4:2	049	.4610	22'45	4.7745	4.6857
33	67.22	4:2	047	.4639	22'44'	1.6430	1.6125
34	67.35	4:2	048 075	.4651	22'45 ; 244'6	0.3569	0.3503
35	67.6	4:2	065 062	.4865	2346 ; 2356	0.0000	0.0000
36	67.81	3:0	035	.4738	33'4	0.0576	0.0641
37	68.15	5:4 4:2	104 044	.4832	22'466' ; 22'35'	3.4375	3.3697
38	68.43	3:0 4:2	037 042	.4870	344' ; 22'34' ; 234'6	2.3448	2.3203
39	69.13	4:2	064 071	.4990	23'34 ; 234'6 ; 23'4'6 +	1.0768	1.0419
40	69.25	4:1	068	.5040	23'45' 7	0.0000	0.0000
41	69.42	5:4	096	.5057	22'366'	0.2672	0.2346
42	69.7	4:2	040	.5102	22'33'	0.6208	0.6093
43	70.09	5:3 4:1	103 057	.5155	22'45'6 ; 233'5	0.3996	0.3831
44	70.48	5:3 4:1	100 067	.5212	22'44'6 ; 23'4'5	0.3213	0.2945
45	70.79	4:1	058 063	.5267	233'5' ; 234'5	0.2527	0.2480
46	71.12	4:1 5:3	074 099	.5340	244'5 ; 22'356'	0.6578	0.6029
47	71.36	4:1	070 061	.5407	23'4'5 ; 2'345 ; 24457	1.5540	1.5062
48	71.62	4:1 5:3	066 095	.5447	23'44' ; 22'356 ; 22'35'6	1.4991	1.3228
49	72.18	5:3 4:1	091 098	.5549	22'34'6 ; 22'3'46 ; 233'4	1.0674	0.9469
50	72.81	4:1	056 060	.5676	233'4' ; 2344'	0.5518	0.5415
51	73.25	6:4 5:3	155 084	.5666	22'44'66' ; 22'33'6; 22'355'	2.1458	1.8735
52	73.49	5:3	089	.5779	22'346'	0.0000	0.0000
53	73.69	5:2	101 090	.5814	22'34'5 ; 22'455'	3.0301	2.6603
54	74.07	5:2	099	.5880	22'44'5	2.1228	1.8638
55	74.59	6:4 5:2	150 112	.5969	22'34'66' ; 233'56 ; 23'44'6	0.3500	0.3073
56	74.82	5:2	083 109	.6029	22'33'5 ; 233'46	0.5621	0.4935
57	75.21	6:4 5:2	152 097	.6062	22'3566' ; 22'345 ; 22'3'45	0.7544	0.6587
58	75.55	5:2	087 111	.6175	22'345' ; 233'55' ; 2344'6	0.4939	0.4336
59	75.86	5:2	085 116	.6224	22'344' ; 234567	0.3078	0.2702
60	76.09	6:4	136	.6257	22'33'66'	0.4446	0.3530
61	76.3	4:0 5:2	077 110	.6295	33'44' ; 233'4'6	5.1776	4.5458
62	76.76	6:3	154	.6349	22'44'56'	0.0827	0.0656
63	77.05	5:2	082	.6456	22'33'4	0.1721	0.1511
64	77.51	6:3	151	.6499	22'355'6	0.5218	0.4144
65	77.77	6:3 5:1	135 124	.6563	22'33'56' ; 2'344'5	0.4278	0.3497
66	77.9	6:3	144	.6584	22'345'6	0.0000	0.0000
67	78.01	5:1 6:3	107 108	.6628	233'4'5 ; 233'45' ; 22'34'56	0.4989	0.4177
68	78.25	5:1	123	.6658	2'344'5	0.0000	0.0000
69	78.39	6:3 5:1	149 118	.6672	22'34'5'6 ; 23'44'5 ; 233'45	4.4029	3.5990
70	78.55	6:3	139 140	.6787	22'344'6 ; 22'344'6'	0.0000	0.0000
71	79.17	6:3 5:1	134 143	.6796	22'33'56' ; 22'3456' ; 2344'5	0.2680	0.2104
72	79.48	5:1 6:4	122 131	.6871	2'33'45; 22'33'46;22'33'55'+	0.0937	0.0789
73	79.97	6:2	146 161	.6955	22'34'55' ; 233'45'6	0.4712	0.3741
74	80.36	6:3 5:1	132 105	.7035	22'33'46' ; 233'44'	0.5404	0.4694
75	80.52	6:2	153	.7036	22'44'55'	3.5757	2.8393
76	81.37	6:2	168	.7068	23'44'5'6	0.0327	0.0260
77	81.52	6:2	141	.7203	22'3455'	0.1647	0.1308
78	81.68	7:4	179	.7205	22'33'566'	0.1121	0.0813
79	82.09	6:2	130	.7284	22'33'45'	0.1751	0.1390
80	82.22	6:2	137	.7329	22'344'5	0.3000	0.2382
81	82.35	7:4	176	.7385	22'33'466'	0.0000	0.0000
82	82.74	6:2	138 163	.7403	22'344'5' ; 233'4'56 ; +2	1.9577	1.5545
83	83.08	6:2	158	.7429	233'44'6	0.2667	0.2118
84	83.49	6:2	129	.7501	22'33'45	0.1359	0.1079
85	83.98	7:3	178	.7537	22'33'55'6	0.0603	0.0437
86	84.22	6:2	166	.7572	2344'56	0.0094	0.0075
87	84.5	7:3	175	.7611	22'33'45'6	0.0206	0.0149
88	84.76	7:3	187 182	.7653	22'34'55'6 ; 22'344'56'	0.2304	0.1670
89	85.15	6:2	128	.7761	22'33'44'	0.4316	0.3427
90	85.4	7:3	183	.7728	22'344'5'6	0.0000	0.0000
91	85.77	6:1	167	.7814	23'44'55'	0.2212	0.1756
92	86.44	7:3	185	.7848	22'3455'6	0.0000	0.0000
93	87.01	7:3	174 181	.7965	22'33'456' ; 22'344'56	0.1611	0.1171
94	87.53	7:3	177	.8031	22'33'4'56	0.1320	0.0960
95	88.04	7:3 6:1	171 156	.8188	22'33'44'6 ; 233'44'5	0.3222	0.2467
96	88.44	8:4	202	.8089	22'33'55'66'	0.0000	0.0000
97	88.51	6:1	157	.8184	233'44'5'	0.0359	0.0285
98	88.91	7:3	173	.8152	22'33'456	0.0000	0.0000
99	89.36	8:4	200 204	.8197	22'33'45'66' ; 22'344'566'	0.0000	0.0000
100	89.67	7:2	172 192	.8278	22'33'455' ; 233'455'6	0.0553	0.0401
101	90.2	8:4	197	.8293	22'33'44'66'	0.0000	0.0000
102	90.45	7:2	180	.8362	22'344'55'	0.3256	0.2360
103	90.86	7:2	193	.8397	233'4'55'6	0.0111	0.0080
104	91.5	7:2	191	.8447	233'44'5'6	0.0053	0.0038
105	92.2	8:4	199	.8494	22'33'4566'	0.0119	0.0079
106	93.9	7:2	170	.8708	22'33'44'5	0.1937	0.1404
107	94.3	7:2	190	.8748	233'44'56	0.0572	0.0415
108	95.63	8:3	198	.8845	22'33'455'6	0.0000	0.0000
109	95.9	8:3	201	.8875	22'33'4'55'6	0.0633	0.0422
110	96.8	8:3	196 203	.8935	22'33'44'5'6 ; 22'344'55'6	0.0780	0.0520
111	98.72	7:1	189	.9142	233'44'55'	0.0000	0.0000
112	101.1	8:3	195	.9321	22'33'44'56	0.0163	0.0108
113	101.87	9:4	208	.9320	22'33'455'66'	0.0000	0.0000
114	103.29	9:4	207	.9423	22'33'44'566'	0.0000	0.0000
115	105.3	8:2	194	.9620	22'33'44'55'	0.0607	0.0405
116	106.77	8:2	205	.9678	233'44'55'6	0.0000	0.0000
117	114.24	9:3	206	1.010	22'33'44'55'6	0.0000	0.0000
118	126.35	10:4	209	1.050	22'33'44'55'66'	0.0000	0.0000

CONCENTRATION = 2.38673
TOTAL MICROMOLES = 0.0083

AVERAGE MOLECULAR WEIGHT = 286.57045
NUMBER OF CALIBRATED PEAKS FOUND = 118

N.B.
21 B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RT32:NB21B.RES

N.B 21B

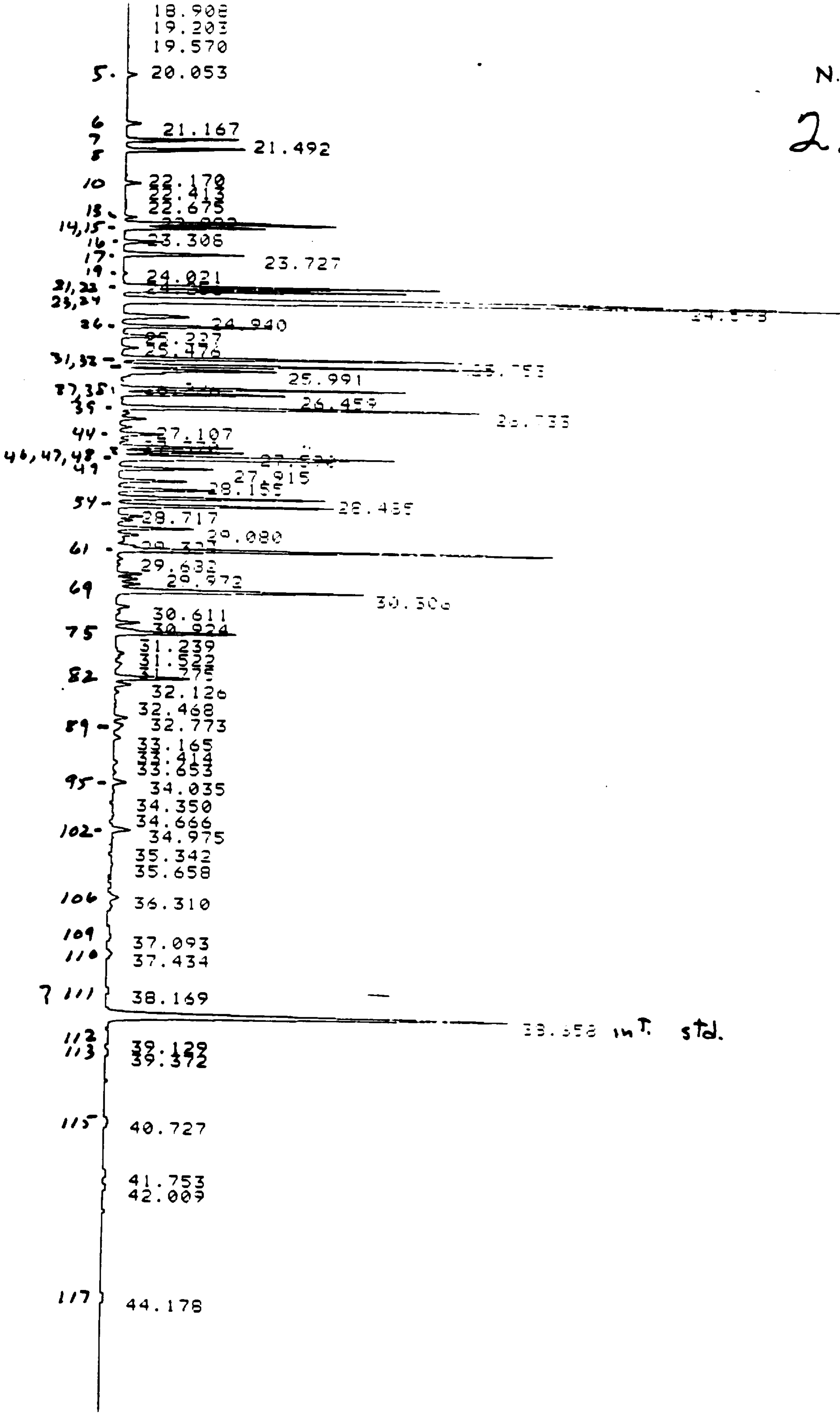
PEAK#	RET. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.59	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.72	1:1	001	.1544	2	0.0000	0.0000
3	50.29	1:0	002	.1937	3	0.0000	0.0000
4	50.63	1:0	003	.1975	4	0.0000	0.0000
5	52.31	2:2	004 010	.2245	22' : 26	0.1943	0.2583
6	54.78	2:1	007 009	.2566	24 : 25	0.0000	0.0000
7	55.57	2:1	006	.2709	23'	1.5887	2.1126
8	56.09	2:1	005 008	.2785	23 : 24'	1.4111	1.8763
9	57.35	2:0	014	.2973	35	0.1971	0.2621
10	57.75	3:3	019	.3045	22'6	0.8162	0.9403
11	58.65	4:2	030	.3165	246	0.0209	0.0241
12	59.27	2:0	011	.3238	33'	0.1911	0.2541
13	59.46	2:0	012 013	.3297	34 : 34'	0.3622	0.4817
14	59.79	3:2 2:0	018 015	.3307	22'5 : 44'	3.9661	4.7681
15	60.02	3:2	017	.3398	22'4	2.0511	2.3638
16	60.7	3:2	024 027	.3508	236 : 23'6	0.3317	0.3821
17	61.32	3:2	016 032	.3625	22'3 : 24'6	1.8473	2.1283
18	62.09	3:1	023	.3778	235	0.0515	0.0593
19	62.43	3:1 4:4	034 054	.3800	2'35 : 22'66'	0.0000	0.0000
20	62.72	3:1	029	.3820	245	0.0338	0.0390
21	62.97	3:1	026	.3911	23'5	3.3152	3.8195
22	63.18	3:1	025	.3937	23'4	2.8374	3.2690
23	63.59	3:1	031	.4024	24'5	3.6514	4.2067
24	63.72	3:1 4:3	028 050	.4031	244' : 22'46	4.6692	5.3650
25	64.45	3:1 4:3	021 033	.4170	233' : 234 : 22'56'	1.6587	1.7260
26	64.99	3:1 4:4	022 051	.4267	234' : 22'46'	1.2594	1.3771
27	65.48	4:3	045	.4334	22'36	0.4506	0.4578
28	65.84	3:1	036	.4379	33'5	0.0000	0.0000
29	66 .5	4:3	046	.4450	22'36'	0.3628	0.3686
30	66.45	3:1	039	.4480	34'5	0.0000	0.0000
31	66.62	4:2	052 073	.4554	22'55' : 23'5'6	6.4591	6.5623
32	66.90	4:2	049	.4610	22'45	4.8990	4.9722
33	67.22	4:2	047	.4639	22'44'	2.0740	2.1071
34	67.5	4:2	048 075	.4651	22'45 : 244'6	0.1638	0.1664
35	67.6	4:2	065 062	.4665	2346 : 2356	0.0000	0.0000
36	67.81	3:0	035	.4730	33'4	0.0343	0.0396
37	68.17	5:4 4:2	104 044	.4832	22'466' : 22'35'	3.2011	3.2484
38	68.43	3:0 4:2	037 042	.4870	344' : 22'34' : 234'6	2.0967	2.1479
39	69.13	4:2	064 071	.4990	23'34 : 234'6 : 23'4'6 +	1.6931	1.7202
40	69.25	4:1	068	.5040	23'45' ?	0.0000	0.0000
41	69.42	5:4	096	.5057	22'366'	0.2292	0.2083
42	69.67	4:2	040	.5102	22'33'	0.5274	0.5359
43	70.11	5:3 4:1	103 057	.5155	22'45'6 : 233'5	0.4128	0.4097
44	70.45	5:3 4:1	100 067	.5212	22'44'6 : 23'4'5	0.4124	0.3912
45	70.79	4:1	058 063	.5267	233'5' : 234'5	0.2245	0.2281
46	71.12	4:1 5:3	074 094	.5340	244'5 : 22'356'	0.6709	0.6565
47	71.36	4:1	070 061	.5407	23'4'5 : 2'345 : 23457	1.4821	1.5058
48	71.72	4:1 5:3	066 095	.5447	23'44' : 22'356 : 22'35'6	4.5961	4.1963
49	72.18	5:3 4:1	091 098	.5549	22'34'6 : 22'3'46 : 233'4	1.3914	1.2778
50	72.81	4:1	056 060	.5676	233'4' : 2344'	0.4767	0.4843
51	73.25	6:4 5:3	155 084	.5666	22'44'66' : 22'33'6: 22'355'	2.3532	2.1278
52	73.49	5:3	089	.5779	22'346'	0.0000	0.0000
53	73.66	5:2	101 090	.5814	22'34'5 : 22'455'	3.8502	3.5067
54	74.07	5:2	099	.5880	22'44'5	2.8465	2.5872
55	74.59	6:4 5:2	150 112	.5969	22'34'66' : 233'56 : 23'44'6	0.3948	0.3585
56	74.8	5:2	083 109	.6029	22'33'5 : 233'46	0.5850	0.5317
57	75.21	6:4 5:2	152 097	.6062	22'3566' : 22'345 : 22'3'45	0.9545	0.8628
58	75.55	5:2	087 111	.6175	22'345' : 233'55' : 2344'6	0.5773	0.5247
59	75.86	5:2	085 116	.6224	22'344' : 234567	0.3454	0.3139
60	76.09	6:4	136	.6257	22'33'66'	0.5026	0.4132
61	76.3	4:0 5:2	077 110	.6295	33'44' : 233'4'6	5.8806	5.3449
62	76.76	6:3	154	.6349	22'44'56'	0.0986	0.0811
63	77.05	5:2	082	.6453	22'33'4	0.1711	0.1555
64	77.51	6:3	151	.6499	22'355'6	0.5942	0.4884
65	77.77	6:3 5:1	135 124	.6563	22'33'56' : 2'344'5	0.5105	0.4320
66	77.9	6:3	144	.6584	22'345'6	0.0000	0.0000
67	78.03	5:1 6:3	107 108	.6628	233'4'5 : 233'45' : 22'34'56	0.5656	0.4982
68	78.25	5:1	123	.6658	2'344'5	0.0000	0.0000
69	78.39	6:3 5:1	149 118	.6672	22'34'5'6 : 23'44'5 : 233'45	5.3392	4.5101
70	78.55	6:3	139 140	.6707	22'344'6 : 22'344'6'	0.0000	0.0000
71	79.17	6:3 5:1	134 143	.6796	22'33'56 : 22'3456': 2344'5	0.3153	0.2886
72	79.51	5:1 6:3	122 131	.6871	2'33'45: 22'33'46:22'33'55'+	0.1118	0.0975
73	80	6:2	146 161	.6955	22'34'55' : 233'45'6	0.5415	0.4451
74	80.36	6:3 5:1	132 105	.7035	22'33'46' : 233'44'	0.5672	0.5180
75	80.52	6:2	153	.7036	22'44'55'	4.3999	3.6168
76	81.34	6:2	168	.7066	23'44'5'6	0.0139	0.0115
77	81.52	6:2	141	.7203	22'3455'	0.1966	0.1616
78	81.73	7:4	179	.7205	22'33'566'	0.1137	0.0853
79	82.07	6:2	130	.7284	22'33'45'	0.2312	0.1900
80	82.22	6:2	137	.7329	22'344'5	0.2778	0.2284
81	82.35	7:4	176	.7305	22'33'466'	0.0000	0.0000
82	82.77	6:2	138 163	.7403	22'344'5' : 233'4'56 : +2	2.1740	1.7871
83	83.08	6:2	158	.7429	233'44'6	0.3282	0.2698
84	83.49	6:2	129	.7501	22'33'45	0.1622	0.1333
85	83.90	7:3	178	.7537	22'33'55'6	0.0465	0.0349
86	84.22	6:2	166	.7572	2344'56	0.0067	0.0055
87	84.5	7:3	175	.7611	22'33'45'6	0.0061	0.0046
88	84.76	7:3	187 182	.7653	22'34'55'6 : 22'344'56'	0.2383	0.1788
89	85.12	6:2	128	.7761	22'33'44'	0.4581	0.3766
90	85.4	7:3	183	.7728	22'344'5'6	0.0000	0.0000
91	85.77	6:1	167	.7819	23'44'55'	0.2786	0.2290
92	86.41	7:3	185	.7848	22'3455'6	0.0201	0.0151
93	87.04	7:3	174 181	.7965	22'33'456' : 22'344'56	0.1640	0.1234
94	87.5	7:3	177	.8031	22'33'4'56	0.1364	0.1026
95	88.02	7:3 6:1	171 156	.8105	22'33'44'6 : 233'44'5	0.3048	0.3072
96	88.44	8:4	202	.8089	22'33'55'66'	0.0000	0.0000
97	88.55	6:1	157	.8104	233'44'5'	0.0000	0.0000
98	88.91	7:3	173	.8152	22'33'456	0.0000	0.0000
99	89.36	8:4	200 204	.8197	22'33'45'66' : 22'344'566'	0.0000	0.0000
100	89.65	7:2	172 192	.8278	22'33'455' : 233'455'6	0.0623	0.0468
101	90.2	8:4	197	.8293	22'33'44'66'	0.0000	0.0000
102	90.45	7:2	180	.8362	22'344'55'	0.3550	0.2664
103	90.84	7:2	193	.8397	233'4'55'6	0.0133	0.0100
104	91.41	7:2	191	.8467	233'44'5'6	0.0047	0.0036
105	92.21	8:4	199	.8494	22'33'4566'	0.0162	0.0112
106	93.9	7:2	170	.8740	22'33'44'5	0.2179	0.1635
107	94.3	7:2	190	.8740	233'44'56	0.0620	0.0471
108	95.63	8:3	198	.8045	22'33'455'6	0.0000	0.0000
109	95.9	8:3	201	.8875	22'33'4'55'6	0.0635	0.0438
110	96.8	8:3	196 203	.8938	22'33'44'5'6 : 22'344'55'6	0.0700	0.0538
111	98.72	7:1	189	.9148	233'44'55'	0.0000	0.0000
112	101.23	8:3	195	.9321	22'33'44'56	0.0000	0.0000
113	101.87	9:4	208	.9320	22'33'455'66'	0.0000	0.0000
114	103.29	9:4	207	.9423	22'33'44'566'	0.0000	0.0000
115	105.37	8:2	194	.9620	22'33'44'55'	0.0000	0.0000
116	106.77	8:2	205	.9670	233'44'55'6	0.0000	0.0000
117	114.2	9:3	206	1.018	22'33'44'55'6	0.0695	0.0494
118	126.35	10:4	209	1.050	22'33'44'55'66'	0.0000	0.0000

CONCENTRATION = 2.705922
TOTAL MICROMOLES = 0.0091

AVERAGE MOLECULAR WEIGHT = 296.66582
NUMBER OF CALIBRATED PEAKS FOUND = 118

N. B.

22 A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37,35
39 26.459
26.733
44 27.107
46,47,48
49 27.915
28.155
54 28.435
28.717
29.080
61
29.632
29.972
69 30.306
30.611
75 30.924
31.239
31.522
82
32.126
32.468
89 32.773
33.165
33.414
33.653
95 34.035
34.350
34.666
102 34.975
35.342
35.658
106 36.310
109 37.093
110 37.434
? 111 38.169
38.658 int. std.
112
113 39.129
39.372
115 40.727
41.753
42.009
117 44.178

22A

MT32:NB22A.RLS

NB 22A

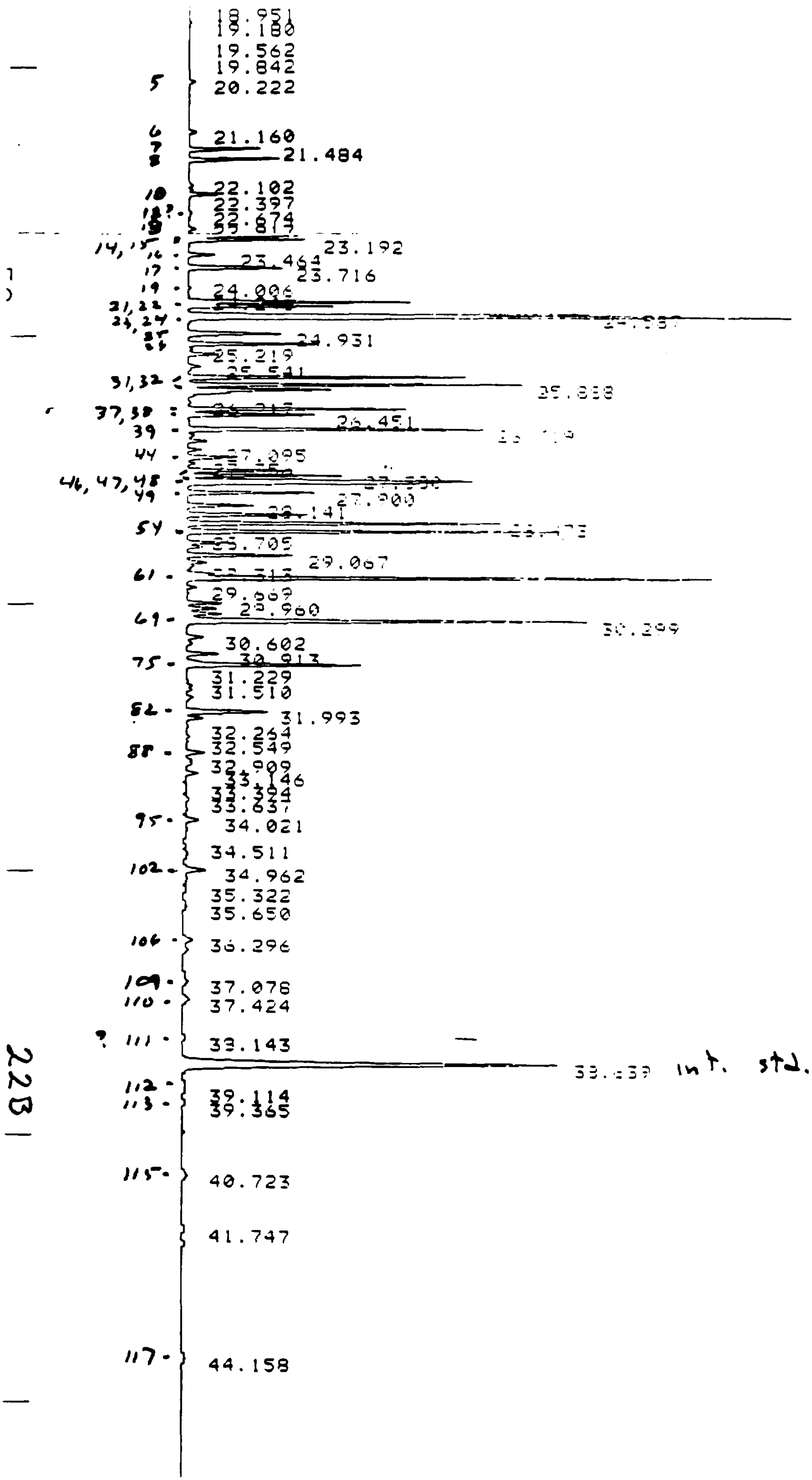
PEAK#	RET. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.6	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.62	1:1	001	.1544	2	0.2651 ?	0.3985
3	50.19	1:0	002	.1937	3	0.0000	0.0000
4	50.58	1:0	003	.1975	4	0.1780	0.2635
5	52.29	2:2	004 010	.2245	22' & 26	1.8474	2.3822
6	54.72	2:1	007 009	.2566	24 & 25	0.6250	0.7799
7	55.50	2:1	006	.2709	23'	3.6053	4.4927
8	56.07	2:1	005 008	.2785	23 & 24'	3.7617	4.6876
9	57.31	2:0	014	.2973	35	0.0518	0.0646
10	57.75	3:3	019	.3045	22'6	0.6729	0.7265
11	58.01	3:2	030	.3165	246	0.0240	0.0260
12	59.02	2:0	011	.3238	33'	0.5278	0.6573
13	59.46	2:0	012 013	.3297	34 & 34'	0.6450	0.8048
14	59.79	3:2 2:0	018 015	.3387	22'5 & 44'	7.7802	8.7507
15	60	3:2	017	.3398	22'4	4.0738	4.3975
16	60.7	3:2	024 027	.3508	236 & 23'6	0.7558	0.8161
17	61.35	3:2	016 032	.3625	22'3 & 24'6	2.2552	2.4349
18	62.1	3:1	023	.3770	235	0.0079	0.0085
19	62.43	3:1 4:4	034 054	.3800	2'35 & 22'66'	0.0000	0.0000
20	62.72	3:1	029	.3820	245	0.0312	0.0336
21	62.98	3:1	026	.3911	23'5	4.2447	4.5828
22	63.16	3:1	025	.3937	23'4	3.9792	4.2962
23	63.6	3:1	031	.4024	24'5	{ 6.7142	7.2491
24	63.77	3:1 4:3	028 050	.4031	244' & 22'46	{ 0.0000	0.0000
25	64.48	3:1 4:3	021 033	.4170	233' & 234 & 22'56'	1.5510	1.5125
26	64.99	3:1 4:3	022 051	.4267	234' & 22'46'	1.2869	1.3187
27	65.49	4:3	045	.4334	22'36	0.8371	0.7970
28	65.72	3:1	036	.4379	33'5	0.0268	0.0289
29	66.05	4:3	046	.4450	22'36'	0.6678	0.6358
30	66.45	3:1	039	.4488	34'5	0.0000	0.0000
31	66.6	4:2	052 073	.4554	22'55' & 23'5'6	6.5243	6.2118
32	66.96	4:2	049	.4618	22'45	5.4085	5.1493
33	67.19	4:2	047	.4639	22'44'	2.4557	2.3381
34	67.35	4:2	048 075	.4651	22'45 & 244'6	0.6858	0.6530
35	67.6	4:2	065 062	.4665	2346 & 2356	0.0000	0.0000
36	67.81	3:0	035	.4738	33'4	0.1264	0.1365
37	68.15	5:4 4:2	104 044	.4832	22'466' & 22'35'	3.3986	3.2320
38	68.41	3:0 4:2	037 042	.4870	344' & 22'34' & 233'6	2.7855	2.6741
39	69.13	4:2	064 071	.4990	23'34 & 234'6 & 23'4'6 +	3.1865	3.0339
40	69.25	4:1	068	.5040	23'45' 7	0.0000	0.0000
41	69.39	5:4	096	.5057	22'366'	0.3026	0.2577
42	69.68	4:2	040	.5102	22'33'	0.3756	0.3576
43	70.09	5:3 4:1	103 057	.5155	22'45'6 & 233'5	0.1834	0.1706
44	70.45	5:3 4:1	100 067	.5212	22'44'6 & 23'45	0.0122	0.7221
45	70.76	4:1	058 063	.5267	233'5' & 234'5	0.1417	0.1349
46	71.1	4:1 5:3	074 094	.5340	244'5 & 22'356'	1.2172	1.0822
47	71.33	4:1	070 061	.5407	23'4'5 & 2'345 & 23457	1.5195	1.4467
48	71.62	4:1 5:3	066 095	.5447	23'44' & 22'356 & 22'35'6	2.0010	2.4662
49	72.19	5:3 4:1	091 090	.5549	22'34'6 & 22'3'46 & 233'4	1.3346	1.1485
50	72.81	4:1	056 060	.5676	233'4' & 2344'	0.7770	0.7405
51	73.25	6:4 5:3	155 084	.5666	22'44'66' & 22'33'6& 22'355'	1.2612	1.0053
52	73.49	5:3	089	.5779	22'346'	0.0000	0.0000
53	73.66	5:2	101 090	.5814	22'34'5 & 22'455'	2.5772	2.1952
54	74.05	5:2	099	.5880	22'44'5	2.5649	2.1846
55	74.59	6:4 5:2	150 112	.5969	22'34'66' & 233'56 & 23'44'6	0.2648	0.2255
56	74.8	5:2	083 109	.6029	22'33'5 & 233'46	0.2656	0.2262
57	75.21	6:4 5:2	152 097	.6062	22'3566' & 22'345 & 22'3'45	0.7708	0.6524
58	75.52	5:2	087 111	.6175	22'345' & 233'55' & 2344'6	0.1613	0.1374
59	75.83	5:2	085 116	.6224	22'344' & 234567	0.0520	0.0443
60	76.09	6:4	136	.6257	22'33'66'	0.3019	0.2326
61	76.5	4:0 5:2	077 110	.6295	33'44' & 233'4'6	3.2463	2.7651
62	76.77	6:3	154	.6349	22'44'56'	0.0756	0.0583
63	77.02	5:2	082	.6453	22'33'4	0.0280	0.0238
64	77.52	6:3	151	.6499	22'355'6	0.3312	0.2552
65	77.75	6:3 5:1	135 124	.6563	22'33'56' & 2'344'5	0.2904	0.2303
66	77.9	6:3	144	.6584	22'345'6	0.0000	0.0000
67	78.03	5:1 6:3	107 109	.6628	233'4'5 & 233'45' & 22'34'56	0.3393	0.2601
68	78.25	5:1	123	.6658	2'344'5	0.0000	0.0000
69	78.37	6:3 5:1	149 118	.6672	22'34'5'6 & 23'44'5 & 233'45	3.0904	2.4507
70	78.55	6:3	139 140	.6707	22'344'6 & 22'344'6'	0.0000	0.0000
71	79.17	6:3 5:1	134 143	.6796	22'33'56' & 22'3456'& 2344'5	0.1868	0.1555
72	79.46	5:1 6:3	122 131	.6871	2'33'45& 22'33'46&22'33'55'+	0.0664	0.0542
73	79.9	6:2	146 161	.6955	22'34'55' & 233'45'6	0.3019	0.2325
74	80.4	6:3 5:1	132 105	.7035	22'33'46' & 233'44'	{ 0.7141	0.6017
75	80.7	6:2	153	.7036	22'44'55'	{ 0.0082	0.0063
76	81.2	6:2	168	.7068	23'44'5'6	{ 0.0128	0.0099
77	81.5	6:2	141	.7203	22'3455'	0.0603	0.0464
78	81.7	7:4	179	.7205	22'33'566'	0.0000	0.0000
79	82	6:2	130	.7284	22'33'45'	0.1023	0.0788
80	82.2	6:2	137	.7329	22'344'5	0.0541	0.0417
81	82.35	7:4	176	.7305	22'33'466'	0.0000	0.0000
82	82.7	6:2	138 163	.7403	22'344'5' & 233'4'56 & +2	0.7371	0.5670
83	83	6:2	158	.7429	233'44'6	0.1670	0.1293
84	83.4	6:2	129	.7501	22'33'45	0.0580	0.0447
85	83.9	7:3	178	.7537	22'33'55'6	0.0390	0.0274
86	84.25	6:2	166	.7572	2344'56	0.0000	0.0000
87	84.5	7:3	175	.7611	22'33'45'6	0.0113	0.0080
88	84.7	7:3	187 182	.7653	22'34'55'6 & 22'344'56'	0.1518	0.1068
89	85.1	6:2	128	.7761	22'33'44'	0.1367	0.1053
90	85.4	7:3	183	.7720	22'344'5'6	0.0000	0.0000
91	85.7	6:1	167	.7814	23'44'55'	0.2159	0.1663
92	86.4	7:3	185	.7848	22'3455'6	0.0105	0.0074
93	87	7:3	174 181	.7965	22'33'456' & 22'344'56	0.0572	0.0404
94	87.5	7:3	177	.8031	22'33'4'56	0.0407	0.0287
95	88	7:3 6:1	171 156	.8105	22'33'44'6 & 233'44'5	0.1598	0.1197
96	88.4	8:4	202	.8089	22'33'55'66'	0.0203	0.0131
97	88.55	6:1	157	.8104	233'44'5'	0.0000	0.0000
98	88.8	7:3	173	.8152	22'33'456	0.0021	0.0015
99	89.3	8:4	200 204	.8197	22'33'45'66' & 22'344'566'	0.0062	0.0040
100	89.68	7:2	172 192	.8278	22'33'455' & 233'455'6	0.0000	0.0000
101	90.2	8:4	197	.8293	22'33'44'66'	0.0000	0.0000
102	90.4	7:2	180	.8362	22'344'55'	0.1699	0.1195
103	90.8	7:2	193	.8397	233'4'55'6	0.0107	0.0075
104	91.4	7:2	191	.8447	233'44'5'6	0.0044	0.0031
105	92.2	8:4	199	.8494	22'33'4566'	0.0168	0.0109
106	93.9	7:2	170	.8748	22'33'44'5	0.0941	0.0662
107	94.3	7:2	190	.8748	233'44'56	0.0352	0.0247
108	95.68	8:3	198	.8845	22'33'455'6	0.0000	0.0000
109	95.9	8:3	201	.9875	22'33'4'55'6	0.0334	0.0216
110	96.8	8:3	196 203	.8935	22'33'44'5'6 & 22'344'55'6	0.0417	0.0269
111	98.7	7:1	189	.9142	233'44'55'	0.0058	0.0040
112	101.2	8:3	195	.9321	22'33'44'56	0.0076	0.0049
113	101.4	9:4	208	.9328	22'33'455'66'	0.0037	0.0022
114	103.2	9:4	207	.9423	22'33'44'566'	0.0000	0.0000
115	105.3	8:2	194	.9628	22'33'44'55'	0.0333	0.0215
116	106.77	8:2	205	.9670	233'44'55'6	0.0000	0.0000
117	114.2	9:3	206	1.010	22'33'44'55'6	0.0488	0.0287
118	126.85	10:4	209	1.058	22'33'44'55'66'	0.0000	0.0000

CONCENTRATION = 2.902769
TOTAL MICROMOLES = 0.0109

AVERAGE MOLECULAR WEIGHT = 278.01908
NUMBER OF CALIBRATED PEAKS FOUND = 118

N. B.

22 B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39.365
40.723
41.747
44.158
int. std.

RT32:NB22B.RES

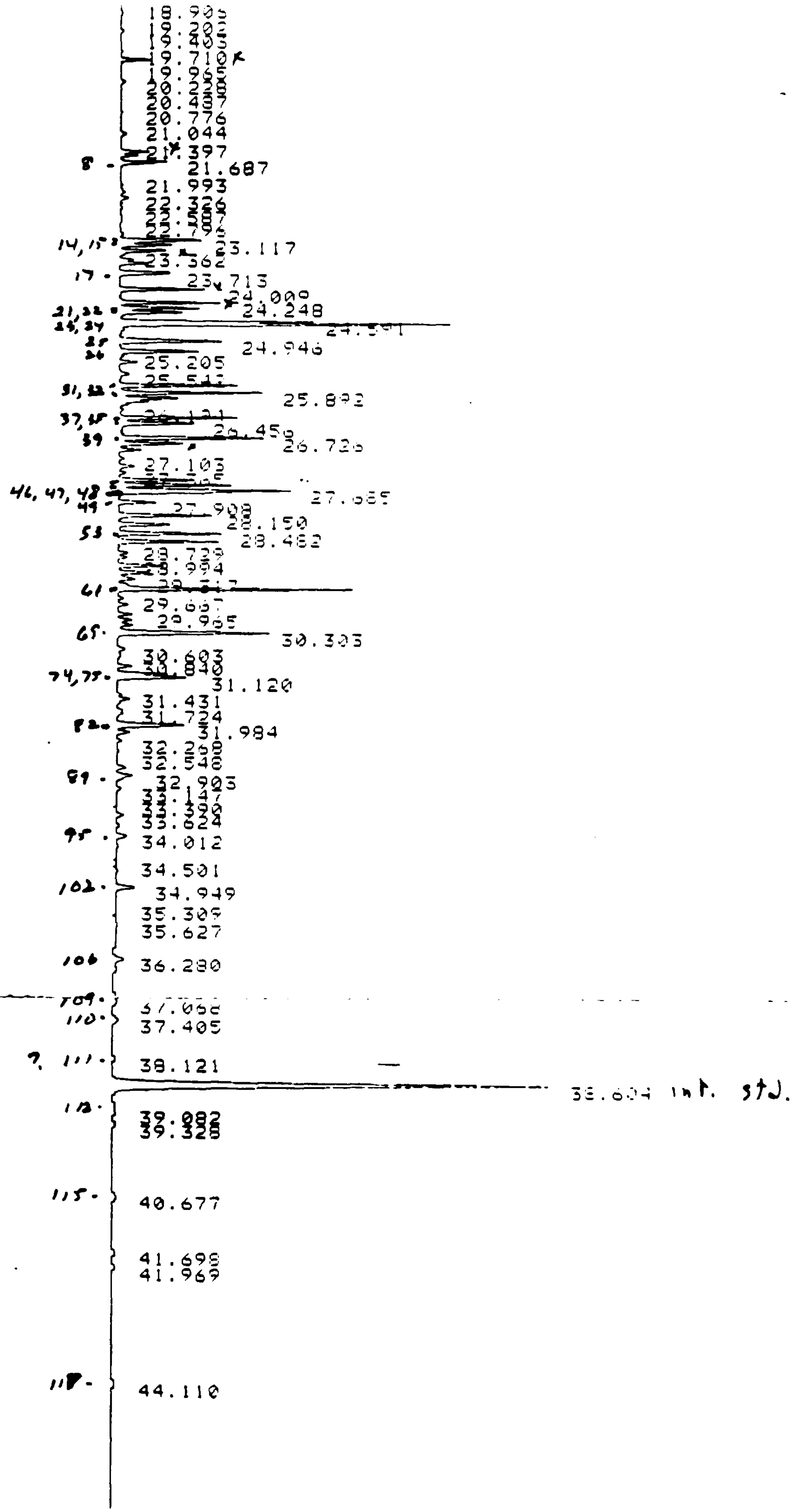
N.B 22B

PEAK#	RET. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.62	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.6	1:1	001	.1544	2	0.2132 ?	0.3187
3	50.19	1:0	002	.1937	3	2.8010 ?	4.1869
4	50.58	1:0	003	.1975	4	0.2878 ?	0.4301
5	52.32	2:2	004 010	.2245	22' : 26	1.0549	1.3334
6	54.75	2:1	007 009	.2564	24 : 25	0.3133	0.3960
7	55.50	2:1	006	.2709	23'	2.1700	2.7427
8	56.07	2:1	005 008	.2785	23 : 24'	2.5527	3.2265
9	57.52	2:0	014	.2973	35	0.1251	0.1581
10	57.75	3:3	019	.3045	22'6	1.1035	1.2960
11	58.81	4:2	030	.3165	246	0.0155	0.0170
12	59.28	2:0	011	.3238	33'	0.2122	0.2682
13	59.44	2:0	012 013	.3297	34 : 34'	0.4358	0.5509
14	59.8	3:2 2:0	018 015	.3387	22'5 : 44'	5.2932	6.0386
15	60.01	3:2	017	.3398	22'4	2.9675	3.2497
16	60.7	3:2	024 027	.3508	236 : 23'6	0.5146	0.5635
17	61.35	3:2	016 032	.3625	22'3 : 24'6	1.7649	1.9328
18	62.1	3:1	023	.3770	235	0.0127	0.0139
19	62.31	3:1 4:4	034 054	.3800	2'35 : 22'66'	0.0697	0.0734
20	62.72	3:1	029	.3820	245	0.0301	0.0329
21	62.98	3:1	026	.3911	23'5	2.7851	3.0500
22	63.16	3:1	025	.3937	23'4	2.3245	2.5455
23	63.6	3:1	031	.4024	24'5	4.6411	5.0824
24	63.73	3:1 4:3	028 050	.4031	244' : 22'46	6.1712	6.7400
25	64.51	3:1 4:3	021 033	.4170	233' : 234 : 22'56'	1.5501	1.5332
26	65	3:1 4:3	022 051	.4267	234' : 22'46'	1.0728	1.1151
27	65.49	4:3	045	.4334	22'36	0.6043	0.5836
28	65.84	3:1	036	.4379	33'5	0.0000	0.0000
29	66.09	4:3	046	.4450	22'36'	0.5023	0.4851
30	66.45	3:1	039	.4488	34'5	0.0000	0.0000
31	66.61	4:2	052 073	.4554	22'55' : 23'5'6	5.3698	5.1857
32	66.97	4:2	049	.4610	22'45	4.5004	4.3461
33	67.2	4:2	047	.4639	22'44'	2.2694	2.1916
34	67.36	4:2	048 075	.4651	22'45 : 244'6	0.5821	0.5622
35	67.6	4:2	065 062	.4865	2346 : 2356	0.0000	0.0000
36	67.82	3:0	035	.4738	33'4	0.1102	0.1207
37	68.13	5:4 4:2	104 044	.4832	22'466' : 22'35'	2.5414	2.4514
38	68.44	3:0 4:2	037 042	.4870	344' : 22'34' : 234'6	2.2079	2.1494
39	69.12	4:2	064 071	.4990	23'34 : 234'6 : 23'4'6 +	2.2498	2.1726
40	69.25	4:1	068	.5040	23'45' 7	0.0000	0.0000
41	69.4	5:4	096	.5057	22'366'	0.2287	0.1976
42	69.66	4:2	040	.5102	22'33'	0.2836	0.2739
43	70.1	5:3 4:1	103 057	.5155	22'45'6 : 233'5	0.2213	0.2088
44	70.46	5:3 4:1	100 067	.5212	22'44'6 : 23'4'5	0.9160	0.8260
45	70.77	4:1	058 063	.5267	233'5' : 234'5	0.1140	0.1101
46	71.11	4:1 5:3	074 094	.5340	244'5 : 22'356'	1.0217	0.9213
47	71.34	4:1	070 061	.5407	23'4'5 : 2'345 : 24457	1.6774	1.6199
48	71.65	4:1 5:3	066 095	.5447	23'44' : 22'356 : 22'35'6	3.0157	2.6183
49	72.17	5:3 4:1	091 098	.5544	22'34'6 : 22'3'46 : 234'4	1.6542	1.4439
50	72.82	4:1	056 060	.5676	233'4' : 2344'	0.6877	0.6641
51	73.23	6:4 5:3	155 084	.5666	22'44'66' : 22'33'6: 22'355'	1.4797	1.2712
52	73.49	5:3	089	.5779	22'346'	0.0008	0.0008
53	73.67	5:2	101 090	.5814	22'34'5 : 22'455'	3.6442	3.1484
54	74.06	5:2	099	.5880	22'44'5	3.8795	3.3516
55	74.61	6:4 5:2	150 112	.5969	22'34'66' : 233'56 : 23'44'6	0.3906	0.3444
56	74.79	5:2	083 109	.6029	22'33'5 : 233'46	0.2830	0.2448
57	75.2	6:4 5:2	152 097	.6062	22'3566' : 22'345 : 22'3'45	0.9949	0.8547
58	75.54	5:2	087 111	.6175	22'345' : 233'55' : 2344'6	0.1477	0.1276
59	75.85	5:2	085 116	.6224	22'344' : 234567	0.0238	0.0201
60	76.11	6:4	136	.6257	22'33'66'	0.4083	0.3191
61	76.3	4:0 5:2	077 110	.6295	33'44' : 233'4'6	3.9789	3.4371
62	76.7	6:3	154	.6349	22'44'56'	0.1290	0.1015
63	77	5:2	082	.6453	22'33'4	0.0113	0.0097
64	77.5	6:3	151	.6499	22'355'6	0.4357	0.3405
65	77.7	6:3 5:1	135 124	.6563	22'33'56' : 2'344'5	0.3574	0.2875
66	77.9	6:3	144	.6584	22'345'6	0.0000	0.0000
67	78	5:1 6:3	107 108	.6628	233'4'5 : 233'45' : 22'34'56	0.4338	0.3632
68	78.3	5:1	123	.6658	2'344'5	4.7672	4.1185
69	78.41	6:3 5:1	149 118	.6672	22'34'5'6 : 23'44'5 : 33'4'45	0.0000	0.0000
70	78.55	6:3	139 140	.6707	22'344'6 : 22'344'6'	0.0000	0.0000
71	79.1	6:3 5:1	134 143	.6796	22'33'56' : 22'3456': 2344'5	0.2201	0.1862
72	79.4	5:1 6:3	122 131	.6871	2'33'45: 22'33'46:22'33'58'+	0.0001	0.0664
73	79.9	6:2	146 161	.6955	22'34'55' : 233'45'6	0.4048	0.3163
74	80.35	6:3 5:1	132 105	.7035	22'33'46' : 233'44'	0.0000	0.0000
75	80.5	6:2	153	.7036	22'44'55'	3.9986	3.1243
76	81.3	6:2	168	.7060	23'44'5'6	0.0168	0.0129
77	81.5	6:2	141	.7203	22'3455'	0.0404	0.0316
78	81.7	7:4	179	.7205	22'33'566'	0.1139	0.0818
79	82	6:2	138	.7284	22'33'45'	0.1152	0.0900
80	82.2	6:2	137	.7329	22'344'5	0.0000	0.0000
81	82.3	7:4	176	.7305	22'33'466'	0.0033	0.0023
82	82.7	6:2	130 163	.7403	22'344'5' : 233'4'56 : +2	0.7672	0.5995
83	83	6:2	158	.7429	233'44'6	0.1546	0.1208
84	83.4	6:2	129	.7501	22'33'45	0.0400	0.0313
85	83.9	7:3	178	.7537	22'33'55'6	0.0501	0.0358
86	84.2	6:2	166	.7572	2344'56	0.0116	0.0091
87	84.4	7:3	175	.7611	22'33'45'6	0.0091	0.0065
88	84.7	7:3	187 182	.7653	22'34'55'6 : 22'344'56'	0.2144	0.1530
89	85.1	6:2	128	.7761	22'33'44'	0.0532	0.0416
90	85.4	7:3	183	.7720	22'344'5'6	0.0647	0.0461
91	85.7	6:1	167	.7814	23'44'55'	0.2606	0.2036
92	86.4	7:3	185	.7848	22'3455'6	0.0127	0.0091
93	87	7:3	174 181	.7965	22'33'456' : 22'344'56	0.0440	0.0314
94	87.5	7:3	177	.8031	22'33'4'56	0.0273	0.0195
95	88.1	7:3 6:1	171 156	.8105	22'33'44'6 : 233'44'5	0.0000	0.0000
96	88.44	8:4	202	.8089	22'33'55'66'	0.0000	0.0000
97	88.5	6:1	157	.8184	233'44'5'	0.0159	0.0124
98	88.91	7:3	173	.8152	22'33'456	0.0000	0.0000
99	89.3	8:4	200 204	.8197	22'33'45'66' : 22'344'566'	0.0056	0.0033
100	89.6	7:2	172 192	.8276	22'33'455' : 233'455'6	0.0352	0.0252
101	90.2	8:4	197	.8293	22'33'44'66'	0.0000	0.0000
102	90.4	7:2	180	.8362	22'344'55'	0.1758	0.1254
103	90.91	7:2	193	.8397	233'4'55'6	0.0000	0.0000
104	91.4	7:2	191	.8447	233'44'5'6	0.0058	0.0042
105	92.2	8:4	199	.8494	22'33'4566'	0.0165	0.0100
106	93.9	7:2	170	.8740	22'33'44'5	0.0790	0.0564
107	94.4	7:2	190	.8740	233'44'56	0.0404	0.0288
108	95.63	8:3	198	.8845	22'33'455'6	0.0000	0.0000
109	95.9	8:3	201	.8875	22'33'4'55'6	0.0350	0.0235
110	96.8	8:3	196 203	.8935	22'33'44'5'6 : 22'344'55'6	0.0577	0.0379
111	98.7	7:1	189	.9142	233'44'55'	0.0046	0.0033
112	101.2	8:3	195	.9321	22'33'44'56	0.0123	0.0081
113	101.9	9:4	208	.9320	22'33'455'66'	0.0015	0.0009
114	103.29	9:4	207	.9423	22'33'44'566'	0.0000	0.0000
115	105.3	8:2	194	.9620	22'33'44'55'	0.0452	0.0297
116	106.0	8:2	205	.9670	233'44'55'6	0.0000	0.0000
117	114.2	9:3	206	1.010	22'33'44'55'6	0.0729	0.0443
118	126.35	10:4	209	1.050	22'33'44'55'66'	0.0000	0.0000

CONCENTRATION = 3.027572
TOTAL MICROMOLES = 0.0107

AVERAGE MOLECULAR WEIGHT = 201.90793

N.B.
24 A



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MT52:NB24A.RES

NB. 24A

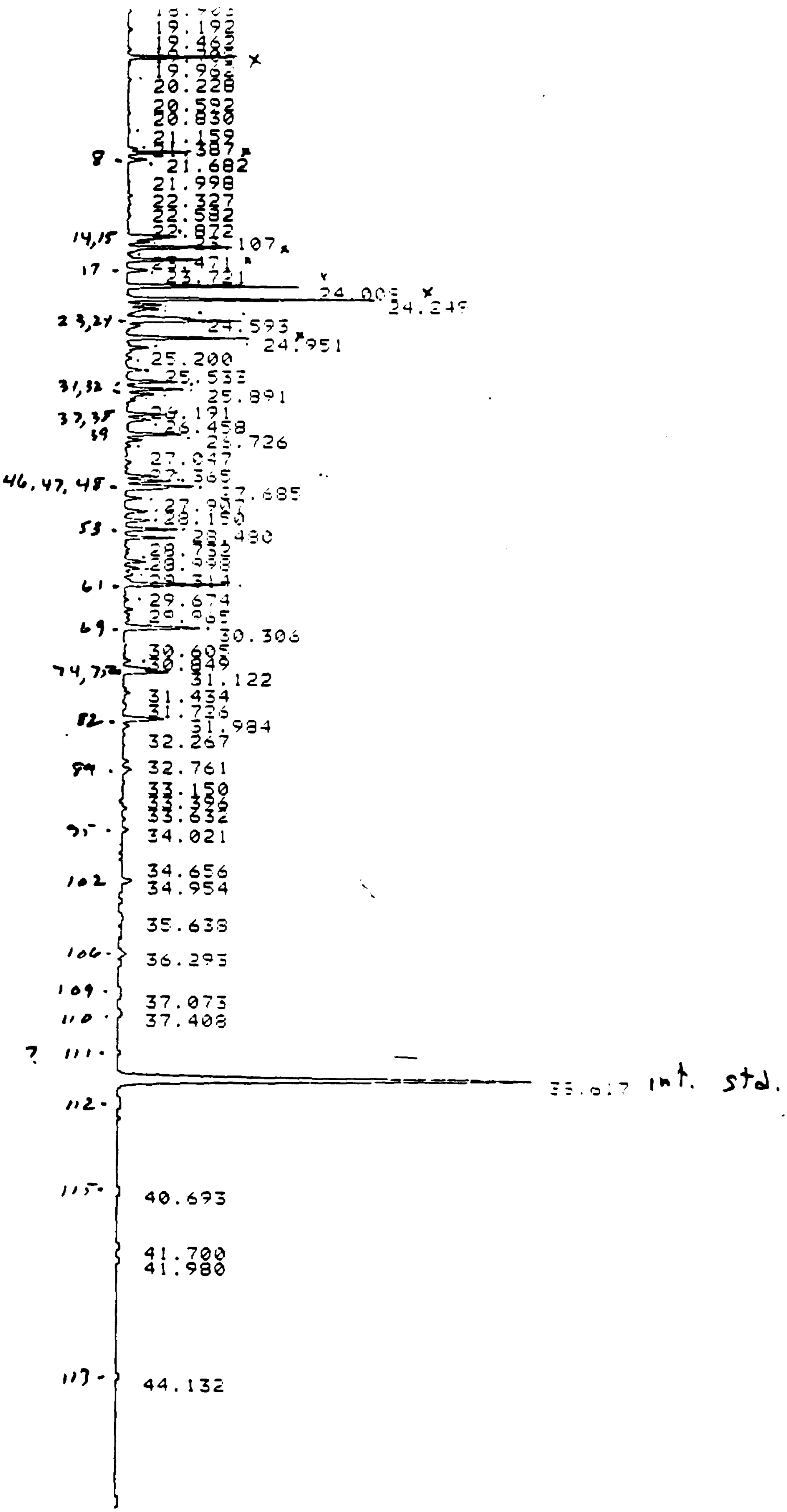
PEAK#	RET. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.8	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.62	1:1	001	.1544	2	13.5520	1[illegible]
3	50.06	1:0	002	.1937	3	10.3625	13.[illegible]
4	50.61	1:0	003	.1975	4	0.2903	0.3913
5	52.32	2:2	004 010	.2245	22' : 26	1.1129	1.2684
6	54.75	2:1	007 009	.2566	24 : 25	0.3273	0.3732
7	55.6	2:1	006	.2709	23'	1.2557	1.4318
8	56.09	2:1	005 008	.2785	23 : 24'	1.9774	2.2546
9	57.34	2:0	014	.2973	35	0.0315	0.0360
10	57.75	3:3	019	.3045	22'6	0.4064	0.4015
11	58.74	3:2	030	.3165	246	0.0741	0.0732
12	59.21	2:0	011	.3230	33'	0.0000	0.0000
13	59.49	2:0	012 013	.3297	34 : 34'	0.2367	0.2699
14	59.8	3:2 2:0	018 015	.3387	22'5 : 44'	4.7663	4.9851
15	60.03	3:2	017	.3398	22'4	1.9054	1.9614
16	60.73	3:2	024 027	.3508	236 : 23'6	0.3244	0.3205
17	61.35	3:2	016 032	.3625	22'3 : 24'6	1.4966	1.4784
18	62.1	3:1	023	.3770	235	2.0186	1.9941
19	62.51	3:1 4:4	034 054	.3800	2'35 : 22'66'	0.0492	0.0468
20	62.72	3:1	029	.3820	245	1.7587	1.7374
21	62.98	3:1	026	.3911	23'5	1.5021	1.4839
22	63.19	3:1	025	.3937	23'4	1.4824	1.4644
23	63.6	3:1	031	.4024	24'5	3.0373	3.0005
24	63.73	3:1 4:3	028 050	.4031	244' : 22'46	4.4639	4.3980
25	64.53	3:1 4:3	021 033	.4170	233' : 234 : 22'56'	2.4927	2.2241
26	65	3:1 4:3	022 051	.4267	234' : 22'46'	1.0633	0.9970
27	65.49	4:3	045	.4334	22'36	0.4826	0.4204
28	65.84	3:1	036	.4379	33'5	0.0000	0.0000
29	66.09	4:3	046	.4450	22'36'	0.6127	0.5338
30	66.45	3:1	039	.4488	34'5	0.0000	0.0000
31	66.63	4:2	052 073	.4554	22'55' : 23'5'6	3.2542	2.8349
32	66.99	4:2	049	.4610	22'45	2.8620	2.4933
33	67.23	4:2	047	.4639	22'44'	1.3375	1.1652
34	67.38	4:2	048 075	.4651	22'45 : 244'6	0.5995	0.5222
35	67.51	4:2	065 062	.4665	2346 : 2356	0.1159	0.1009
36	67.77	3:0	035	.4738	33'4	0.1967	0.1943
37	68.16	5:4 4:2	104 044	.4832	22'466' : 22'35'	2.0145	1.7529
38	68.44	3:0 4:2	037 042	.4870	344' : 22'34' : 234'6	2.0330	1.7850
39	68.93	4:2	064 071	.4990	23'34 : 234'6 : 23'4'6 +	0.0428	0.0373
40	69.25	4:1	068	.5040	23'45' ?	0.0000	0.0000
41	69.4	5:4	096	.5057	22'366'	2.2401	1.7458
42	69.71	4:2	040	.5102	22'33'	0.4361	0.3799
43	70.13	5:3 4:1	103 057	.5155	22'45'6 : 233'5	0.1542	0.1312
44	70.46	5:3 4:1	100 067	.5212	22'44'6 : 23'4'5	0.3998	0.3253
45	70.8	4:1	058 063	.5267	233'5' : 234'5	0.1629	0.1419
46	71.13	4:1 5:3	074 094	.5340	244'5 : 22'356'	1.0083	0.8780
47	71.37	4:1	070 061	.5407	23'4'5 : 2'345 : 23457	1.9277	1.6794
48	71.63	4:1 5:3	066 095	.5447	23'44' : 22'356 : 22'35'6	3.4967	2.7380
49	72.2	5:3 4:1	091 098	.5549	22'34'6 : 22'3'46 : 244'6	0.7568	0.5955
50	72.82	4:1	056 060	.5676	233'4' : 2344'	1.4314	1.2470
51	73.26	6:4 5:3	155 084	.5666	22'44'66' : 22'33'6: 22'355'	0.9298	0.7206
52	73.44	5:3	089	.5779	22'346'	0.0000	0.0000
53	73.7	5:2	101 090	.5814	22'34'5 : 22'455'	1.8887	1.4720
54	74.09	5:2	099	.5880	22'44'5	1.5774	1.2293
55	74.6	6:4 5:2	150 112	.5969	22'34'66' : 233'56 : 23'44'6	0.1629	0.1270
56	74.81	5:2	083 109	.6029	22'33'5 : 233'46	0.2214	0.1725
57	75.22	6:4 5:2	152 097	.6062	22'3566' : 22'345 : 22'3'45	0.6428	0.4976
58	75.54	5:2	087 111	.6175	22'345' : 233'55' : 2344'6	0.3251	0.2534
59	75.85	5:2	085 116	.6224	22'344' : 234567	0.2462	0.1919
60	76.1	6:4	136	.6257	22'33'66'	0.2085	0.1470
61	76.31	4:0 5:2	077 110	.6295	33'44' : 233'4'6	2.3193	1.8075
62	76.75	6:3	154	.6349	22'44'56'	0.1064	0.0750
63	77.06	5:2	082	.6453	22'33'4	0.1221	0.0952
64	77.5	6:3	151	.6499	22'355'6	0.2731	0.1925
65	77.7	6:3 5:1	135 124	.6563	22'33'56' : 2'344'5	0.2495	0.1811
66	77.9	6:3	144	.6584	22'345'6	0.0000	0.0000
67	78	5:1 6:3	107 108	.6628	233'4'5 : 233'45' : 22'34'56	0.2867	0.2165
68	78.25	5:1	123	.6658	2'344'5	0.0000	0.0000
69	78.4	6:3 5:1	149 118	.6672	22'34'5'6 : 23'44'5 : 233'45	2.5241	1.8315
70	78.55	6:3	139 140	.6707	22'344'6 : 22'344'6'	0.0000	0.0000
71	79.1	6:3 5:1	134 143	.6796	22'33'56' : 22'3456': 2344'5	0.1514	0.1155
72	79.4	5:1 6:3	122 131	.6871	2'33'45: 22'33'46:22'34'55'+	0.0566	0.0423
73	79.9	6:2	146 161	.6955	22'34'55' : 233'45'6	0.2294	0.1617
74	80.3	6:3 5:1	132 105	.7035	22'33'46' : 233'44'	0.3425	0.2641
75	80.5	6:2	153	.7036	22'44'55'	2.2283	1.5786
76	81.3	6:2	168	.7068	23'44'5'6	0.0437	0.0308
77	81.5	6:2	141	.7203	22'3455'	0.1068	0.0747
78	81.7	7:4	179	.7205	22'33'566'	0.0849	0.0546
79	82	6:2	130	.7284	22'33'45'	0.0996	0.0702
80	82.2	6:2	137	.7329	22'344'5	0.1437	0.1013
81	82.35	7:4	176	.7385	22'33'466'	0.0000	0.0000
82	82.7	6:2	138 163	.7483	22'344'5' : 233'4'56 : +2	0.9401	0.6626
83	83	6:2	158	.7429	233'44'6	0.1733	0.1221
84	83.4	6:2	129	.7501	22'33'45	0.0841	0.0593
85	83.9	7:3	178	.7537	22'33'55'6	0.0253	0.0163
86	84.29	6:2	166	.7572	2344'56	0.0000	0.0000
87	84.4	7:3	175	.7611	22'33'45'6	0.0000	0.0000
88	84.7	7:3	187 182	.7653	22'34'55'6 : 22'344'56'	0.1533	0.0987
89	85.1	6:2	128	.7761	22'33'44'	0.2257	0.1591
90	85.4	7:3	183	.7720	22'344'5'6	0.0000	0.0000
91	85.7	6:1	167	.7814	23'44'55'	0.1533	0.1081
92	86.44	7:3	185	.7848	22'3455'6	0.0000	0.0000
93	87	7:3	174 181	.7965	22'33'456' : 22'344'56	0.0993	0.0640
94	87.4	7:3	177	.8031	22'33'4'56	0.0743	0.0479
95	88	7:3 6:1	171 156	.8105	22'33'44'6 : 233'44'5	0.1858	0.1269
96	88.4	8:4	202	.8089	22'33'55'66'	0.0255	0.0151
97	88.55	6:1	157	.8184	233'44'5'	0.0000	0.0000
98	88.91	7:3	173	.8152	22'33'456	0.0000	0.0000
99	89.36	8:4	200 204	.8197	22'33'45'66' : 22'344'566'	0.0000	0.0000
100	89.6	7:2	172 192	.8278	22'33'455' : 233'455'6	0.0411	0.0264
101	90.2	8:4	197	.8293	22'33'44'66'	0.0000	0.0000
102	90.4	7:2	180	.8362	22'344'55'	0.2221	0.1429
103	90.8	7:2	193	.8397	233'4'55'6	0.0062	0.0040
104	91.44	7:2	191	.8447	233'44'5'6	0.0000	0.0000
105	92.1	8:4	199	.8494	22'33'4566'	0.0257	0.0152
106	93.8	7:2	170	.8744	22'33'44'5	0.1229	0.0791
107	94.3	7:2	190	.8748	233'44'56	0.0347	0.0223
108	95.63	8:3	198	.8845	22'33'455'6	0.0000	0.0000
109	95.9	8:3	201	.8875	22'33'4'55'6	0.0429	0.0254
110	96.7	8:3	196 203	.8935	22'33'44'5'6 : 22'344'55'6	0.0548	0.0322
111	98.72	7:1	189	.9102	233'44'55'	0.0000	0.0000
112	101.23	8:3	195	.9321	22'33'44'56	0.0000	0.0000
113	101.87	9:4	208	.9328	22'33'455'66'	0.0000	0.0000
114	103.29	9:4	207	.9473	22'33'44'566'	0.0000	0.0000
115	105.2	8:2	194	.9628	22'33'44'55'	0.0371	0.0220
116	106.77	8:2	205	.9678	233'44'55'6	0.0000	0.0000
117	114.24	9:3	206	1.010	22'33'44'55'6	0.0000	0.0000
118	126.35	10:4	209	1.050	22'33'44'55'66'	0.0000	0.0000

CONCENTRATION = 1.943921
TOTAL MICROMOLES = 0.0076

AVERAGE MOLECULAR WEIGHT = 2[illegible]

N. B.

24 B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24B

RT32:NB24B.RLS

N.B 24B

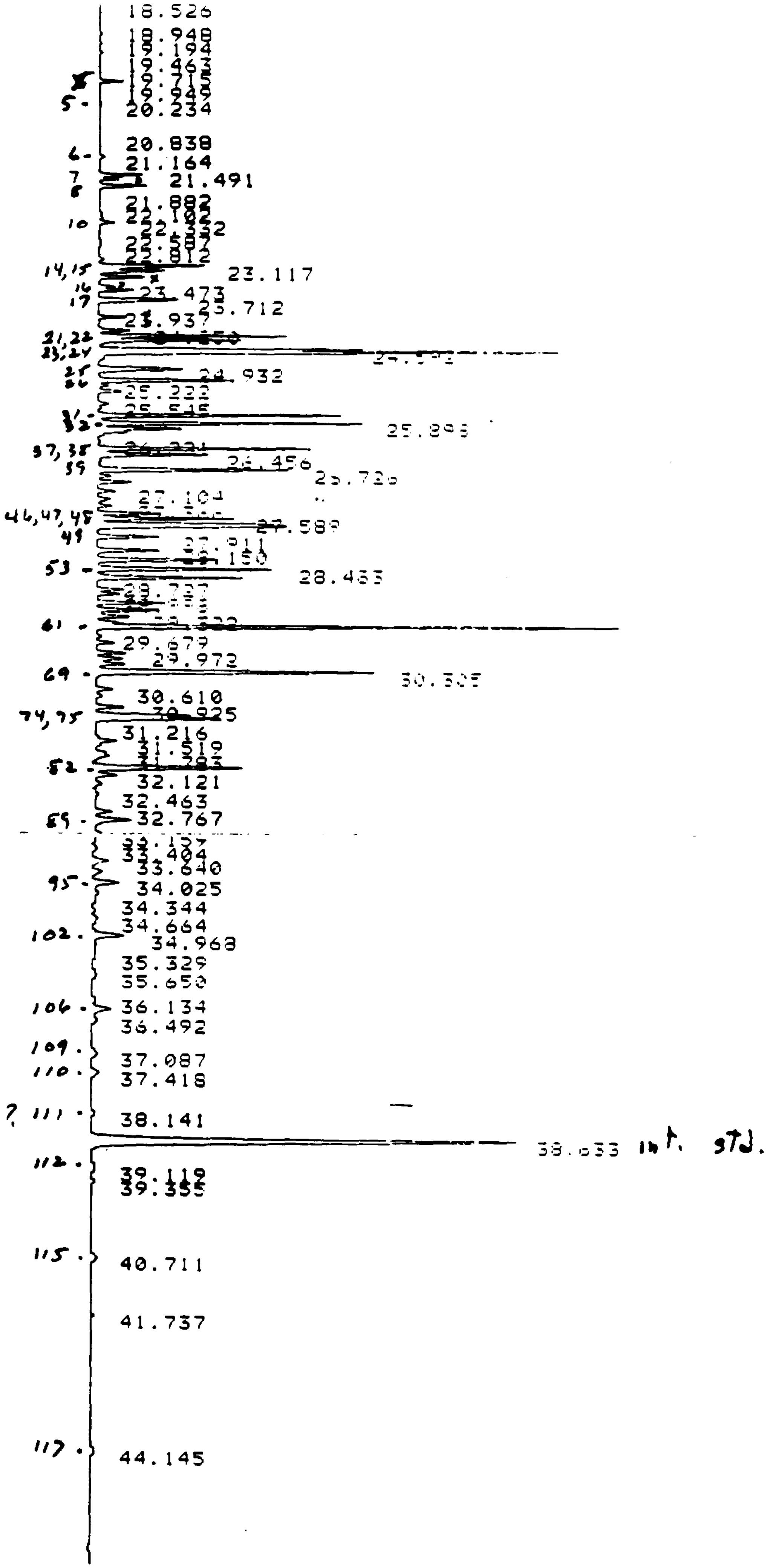
PEAK#	RET. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.77	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.6	1:1	001	.1544	2	47.6971	57.3007
3	50.32	1:0	002	.1937	3	0.9007	1.1[illegible]
4	50.58	1:0	003	.1975	4	0.4533	[illegible]446
5	52.52	2:2	004 010	.2245	22' : 26	0.0096	[illegible].0186
6	54.78	2:1	007 009	.2566	24 : 25	0.0000	0.0000
7	55.50	2:1	006	.2709	23'	0.6116	0.6215
8	56.1	2:1	005 008	.2785	23 : 24'	0.9726	0.9883
9	57.47	2:0	014	.2973	35	0.1204	0.1223
10	57.75	3:3	019	.3045	22'6	0.2644	0.2328
11	58.74	3:2	030	.3165	246	0.0610	0.0537
12	59.21	2:0	011	.3250	33'	0.0000	0.0000
13	59.46	2:0	012 013	.3297	34 : 34'	0.1408	0.1451
14	59.77	3:2 2:0	018 015	.3387	22'5 : 44'	4.3399	3.9802
15	60.01	3:2	017	.3398	22'4	0.9547	0.8405
16	60.7	3:2	024 027	.3500	236 : 23'6	0.1228	0.1081
17	61.38	3:2	016 032	.3625	22'3 : 24'6	0.6370	0.5608
18	62.1	3:1	023	.3770	235	4.4895	3.9524
19	62.39	3:1 4:4	034 054	.3800	2'35 : 22'66'	0.0805	0.0681
20	62.72	3:1	029	.3820	245	4.6927	4.1313
21	62.98	3:1	026	.3911	23'5	0.7791	0.6859
22	63.19	3:1	025	.3937	23'4	1.1676	1.0279
23	63.63	3:1	031	.4024	24'5	1.2709	1.1188
24	63.73	3:1 4:3	028 050	.4031	244' : 22'46	1.8292	1.6068
25	64.56	3:1 4:3	021 033	.4170	233' : 234 : 22'56'	2.6990	2.1460
26	65	3:1 4:3	022 051	.4267	234' : 22'46'	0.3570	0.2983
27	65.49	4:3	045	.4334	22'36	0.2247	0.1745
28	65.84	3:1	036	.4379	33'5	0.0008	0.0000
29	66.06	4:3	046	.4450	22'36'	1.2265	0.9522
30	66.45	3:1	039	.4488	34'5	0.0000	0.0000
31	66.63	4:2	052 073	.4554	22'55' : 23'5'6	1.7458	1.3553
32	66.99	4:2	049	.4618	22'45	1.5511	1.2042
33	67.23	4:2	047	.4639	22'44'	0.6825	0.5298
34	67.38	4:2	048 075	.4651	22'45 : 244'6	0.2929	0.2274
35	67.51	4:2	065 062	.4665	2346 : 2356	0.1541	0.1197
36	67.77	3:0	035	.4738	33'4	0.1780	0.1567
37	68.19	5:4 4:2	104 044	.4832	22'466' : 22'35'	0.7927	0.6147
38	68.44	3:0 4:2	037 042	.4870	344' : 22'34' : 234'6	0.9189	0.7193
39	69.14	4:2	064 071	.4990	23'34 : 234'6 : 23'4'6 +	0.7815	0.6067
40	69.25	4:1	068	.5040	23'45' ?	0.0000	0.0000
41	69.4	5:4	096	.5057	22'366'	0.6353	0.4912
42	69.69	4:2	040	.5102	22'33'	0.1367	0.1061
43	70.1	5:3 4:1	103 057	.5155	22'45'6 : 233'5	0.1218	0.0923
44	70.49	5:3 4:1	100 067	.5212	22'44'6 : 23'4'5	0.2081	0.1589
45	70.8	4:1	058 063	.5267	233'5' : 234'5	0.0748	0.0581
46	71.14	4:1 5:3	074 094	.5340	244'5 : 22'356'	0.4089	0.3487
47	71.37	4:1	070 061	.5407	23'4'5 : 2'345 : 2345?	0.8588	0.6667
48	71.63	4:1 5:3	066 095	.5447	23'44' : 22'356 : 22'35'6	1.6462	1.1490
49	72.2	5:3 4:1	091 098	.5549	22'34'6 : 22'3'46 : 234'4	0.4063	0.2851
50	72.84	4:1	056 060	.5676	233'4' : 2344'	0.4928	0.3826
51	73.26	6:4 5:3	155 084	.5666	22'44'66' : 22'33'6: 22'355'	0.5052	0.3489
52	73.49	5:3	089	.5779	22'346'	0.0000	0.0000
53	73.67	5:2	101 090	.5814	22'34'5 : 22'455'	1.0796	0.7498
54	74.09	5:2	099	.5880	22'44'5	0.8777	0.6096
55	74.6	6:4 5:2	150 112	.5969	22'34'66' : 233'56 : 23'44'6	0.0974	0.0677
56	74.8	5:2	083 109	.6029	22'33'5 : 233'46	0.1091	0.0758
57	75.2	6:4 5:2	152 097	.6062	22'3566' : 22'345 : 22'3'45	0.3412	0.2356
58	75.5	5:2	087 111	.6175	22'345' : 233'55' : 2344'6	0.1645	0.1142
59	75.8	5:2	085 116	.6224	22'344' : 234567	0.1513	0.1051
60	76.1	6:4	136	.6257	22'33'66'	0.1357	0.0852
61	76.3	4:0 5:2	077 110	.6295	33'44' : 233'4'6	1.1837	0.8221
62	76.7	6:3	154	.6349	22'44'56'	0.0468	0.0294
63	77	5:2	082	.6453	22'33'4	0.0562	0.0390
64	77.5	6:3	151	.6499	22'355'6	0.1777	0.1116
65	77.7	6:3 5:1	135 124	.6563	22'33'56' : 2'344'5	0.1516	0.0980
66	77.9	6:3	144	.6584	22'345'6	0.0000	0.0000
67	78	5:1 6:4	107 108	.6628	233'4'5 : 233'45' : 22'34'56	0.1618	0.1089
68	78.25	5:1	123	.6656	2'344'5	0.0000	0.0000
69	78.4	6:3 5:1	149 118	.6672	22'34'5'6 : 23'44'5 : 233'45	1.4692	0.9468
70	78.55	6:3	139 140	.6707	22'344'6 : 22'344'6'	0.0000	0.0000
71	79.1	6:3 5:1	134 143	.6796	22'33'56' : 22'3456' : 2344'5	0.0841	0.0572
72	79.4	5:1 6:4	122 131	.6871	2'33'45: 22'33'46:22'33'55'+	0.0449	0.0299
73	79.9	6:2	146 161	.6955	22'34'55' : 233'45'6	0.1741	0.1093
74	80.3	6:3 5:1	132 105	.7035	22'33'46' : 233'44'	0.2181	0.1444
75	80.5	6:2	153	.7036	22'44'55'	1.5086	0.9425
76	81.3	6:2	168	.7068	23'44'5'6	0.0434	0.0272
77	81.5	6:2	141	.7203	22'3455'	0.0696	0.0437
78	81.7	7:4	179	.7205	22'33'566'	0.0572	0.0328
79	82	6:2	130	.7284	22'33'45'	0.0484	0.0304
80	82.2	6:2	137	.7329	22'344'5	0.1122	0.0705
81	82.35	7:4	176	.7385	22'33'466'	0.0000	0.0000
82	82.7	6:2	138 163	.7403	22'344'5' : 233'4'56 : +2	0.6227	0.3912
83	83.1	6:2	158	.7429	233'44'6	0.1082	0.0680
84	83.4	6:2	129	.7501	22'33'45	0.0490	0.0308
85	83.9	7:3	178	.7537	22'33'55'6	0.0165	0.0094
86	84.25	6:2	166	.7572	2344'56	0.0000	0.0000
87	84.4	7:3	175	.7611	22'33'45'6	0.0000	0.0000
88	84.7	7:3	187 182	.7654	22'34'55'6 : 22'344'56'	0.1055	0.0605
89	85.1	6:2	128	.7761	22'33'44'	0.1483	0.0931
90	85.4	7:3	183	.7720	22'344'5'6	0.0000	0.0000
91	85.7	6:1	167	.7814	23'44'55'	0.0912	0.0573
92	86.4	7:3	185	.7840	22'3455'6	0.0111	0.0064
93	87	7:3	174 181	.7965	22'33'456' : 22'344'56	0.0704	0.0405
94	87.5	7:3	177	.8031	22'33'4'56	0.0544	0.0313
95	88	7:3 6:1	171 156	.8105	22'33'44'6 : 233'44'5	0.1157	0.0707
96	88.44	8:4	202	.8089	22'33'55'66'	0.0000	0.0000
97	88.5	6:1	157	.8104	233'44'5'	0.0151	0.0095
98	88.91	7:3	173	.8152	22'33'456	0.0000	0.0000
99	89.36	8:4	200 204	.8197	22'33'45'66' : 22'344'566'	0.0000	0.0000
100	89.6	7:2	172 192	.8278	22'33'455' : 233'455'6	0.0314	0.0180
101	90.2	8:4	197	.8293	22'33'44'66'	0.0000	0.0000
102	90.4	7:2	180	.8362	22'344'55'	0.1604	0.0920
103	90.8	7:2	193	.8397	233'4'55'6	0.0051	0.0030
104	91.44	7:2	191	.8447	233'44'5'6	0.0000	0.0000
105	92.2	8:4	199	.8494	22'33'4566'	0.0318	0.0164
106	93.9	7:2	170	.8740	22'33'44'5	0.0881	0.0505
107	94.44	7:2	190	.8740	233'44'56	0.0000	0.0000
108	95.63	8:3	198	.8845	22'33'455'6	0.0000	0.0000
109	95.9	8:3	201	.8875	22'33'4'55'6	0.0202	0.0149
110	96.7	8:3	196 203	.8965	22'33'44'5'6 : 22'344'55'6	0.0372	0.0196
111	98.72	7:1	189	.9142	233'44'55'	0.0000	0.0000
112	101.23	8:3	195	.9321	22'33'44'56	0.0000	0.0000
113	101.87	9:4	208	.9328	22'33'455'66'	0.0000	0.0000
114	103.29	9:4	207	.9425	22'33'44'566'	0.0000	0.0000
115	105.2	8:2	194	.9620	22'33'44'55'	0.0247	0.0130
116	106.77	8:2	205	.9678	233'44'55'6	0.0000	0.0000
117	114.24	9:3	206	1.010	22'33'44'55'6	0.0000	0.0000
118	126.35	10:4	209	1.050	22'33'44'55'66'	0.0000	0.0000

CONCENTRATION = 1.671611
TOTAL MICROMOLES = 0.0074

AVERAGE MOLECULAR WEIGHT = 226.69104
NUMBER OF CALIBRATED PEAKS FOUND = 118

N.B.

26 A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HT32:NB26A.RES

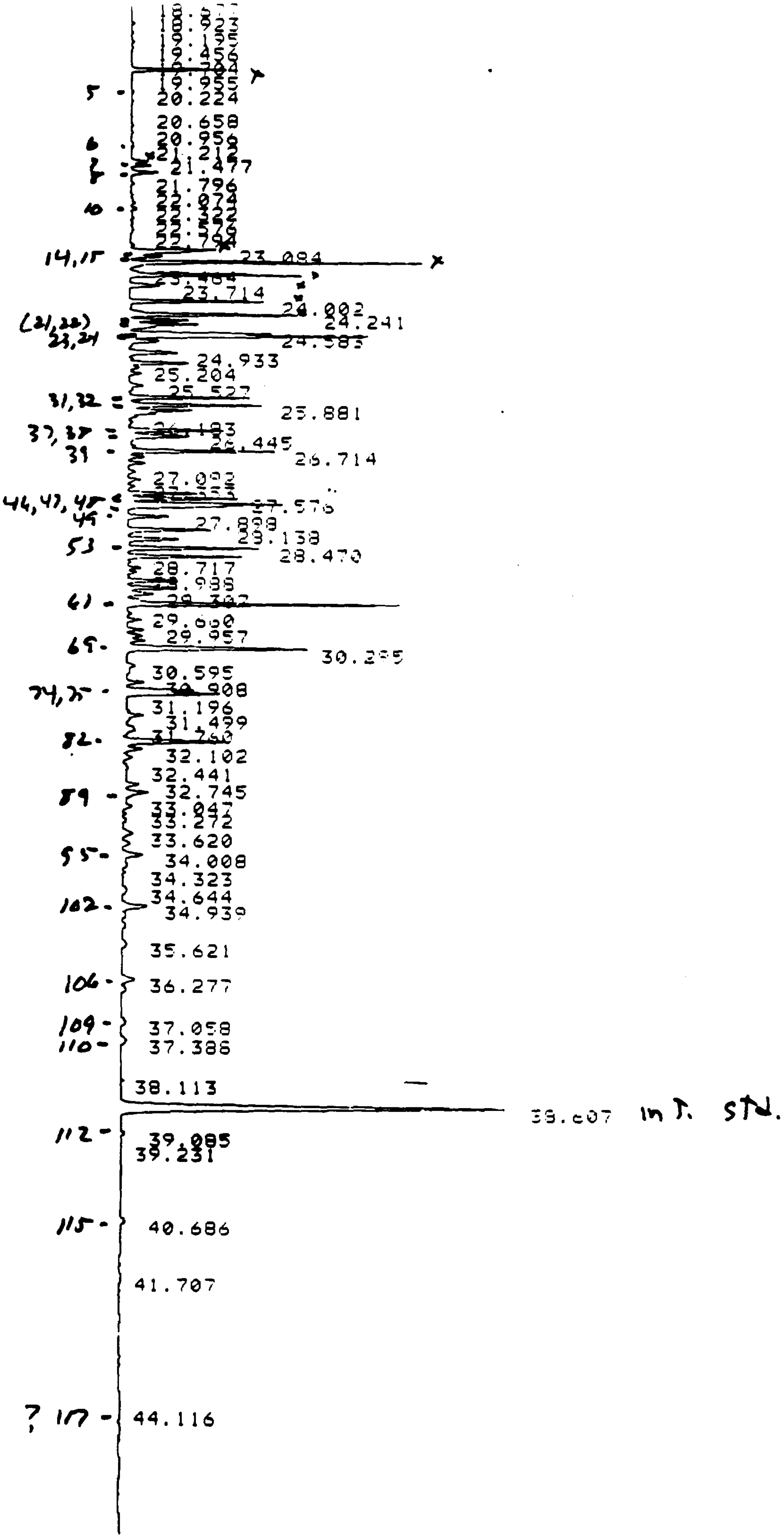
N.B. 26A

PEAK#	RET. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.81	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.62	1:1	001	.1544	2	9.1840	13.2563
3	50.34	1:0	002	.1937	3	2.8061	4.0509
4	50.6	1:0	003	.1975	4	0.1441	0.2081
5	52.34	2:2	004 010	.2245	22' : 26	0.3362	0.4185
6	54.74	2:1	007 009	.2566	24 : 25	0.1985	0.2326
7	55.6	2:1	006	.2709	23'	1.6242	1.9833
8	56.09	2:1	005 008	.2785	23 : 24'	1.6181	1.9750
9	57.33	2:0	014	.2973	35	0.1255	0.1530
10	57.77	3:3	019	.3044	22'6	0.6053	0.6403
11	58.83	3:2	030	.3165	246	0.0155	0.0164
12	59.21	2:0	011	.3238	33'	0.0000	0.0000
13	59.45	2:0	012 013	.3297	34 : 34'	0.2646	0.3288
14	59.79	3:2 2:0	018 015	.3387	22'5 : 44'	5.0834	5.6024
15	60.02	3:2	017	.3398	22'4	2.1214	2.2443
16	60.72	3:2	024 027	.3508	236 : 23'6	0.3288	0.3470
17	61.32	3:2	016 032	.3625	22'3 : 24'6	1.8892	1.9986
18	62.12	3:1	023	.3778	235	0.5154	0.5452
19	62.45	3:1 4:4	034 054	.3888	2'35 : 22'66'	0.0000	0.0000
20	62.72	3:1	029	.3828	245	0.5570	0.5892
21	62.97	3:1	026	.3911	23'5	2.7283	2.8863
22	63.18	3:1	025	.3937	23'4	2.4568	2.5998
23	63.6	3:1	031	.4024	24'5	3.8075	4.0288
24	63.72	3:1 4:3	028 050	.4031	244' : 22'46	5.1767	5.4618
25	64.5	3:1 4:3	021 033	.4178	233' : 234 : 22'36'	1.8798	1.7962
26	65.02	3:1 4:3	022 051	.4267	234' : 22'46'	1.3618	1.3674
27	65.51	4:3	045	.4334	22'36	0.4918	0.4588
28	65.84	3:1	036	.4379	33'5	0.0000	0.0000
29	66.08	4:3	046	.4450	22'36'	0.5147	0.4802
30	66.45	3:1	039	.4488	34'5	0.0000	0.0000
31	66.62	4:2	052 073	.4554	22'55' : 23'5'6	5.2780	4.9247
32	66.99	4:2	049	.4610	22'45	4.1827	3.9021
33	67.22	4:2	047	.4639	22'44'	1.5275	1.4250
34	67.37	4:2	048 075	.4651	22'45 : 244'6	0.4859	0.4533
35	67.6	4:2	065 062	.4865	2346 : 2356	0.0000	0.0000
36	67.84	3:0	035	.4738	33'4	0.0849	0.0898
37	68.15	5:4 4:2	104 044	.4832	22'466' : 22'35'	2.9814	2.7036
38	68.44	3:0 4:2	037 042	.4870	344' : 22'34' : 234'6	2.2956	2.1594
39	69.13	4:2	064 071	.4990	23'34 : 234'6 : 23'4'6 +	1.8451	1.7213
40	69.25	4:1	068	.5040	23'45' 7	0.0000	0.0000
41	69.42	5:4	096	.5057	22'366'	0.3769	0.3145
42	69.7	4:2	040	.5102	22'33'	0.5588	0.5213
43	70.12	5:3 4:1	103 057	.5155	22'45'6 : 233'5	0.3378	0.3079
44	70.48	5:3 4:1	100 067	.5212	22'44'6 : 23'4'5	0.3219	0.2804
45	70.79	4:1	058 063	.5267	233'5' : 234'5	0.2236	0.2086
46	71.13	4:1 5:3	074 094	.5340	244'5 : 22'356'	0.7763	0.6762
47	71.36	4:1	070 061	.5407	23'4'5 : 2'345 : 23457	1.6883	1.5751
48	71.62	4:1 5:3	066 095	.5447	23'44' : 22'356 : 22'35'6	1.7103	1.4913
49	72.19	5:3 4:1	091 098	.5549	22'34'6 : 22'3'46 : 233'4	0.9785	0.8252
50	72.84	4:1	056 060	.5676	233'4' : 2344'	0.8163	0.7615
51	73.25	6:4 5:3	155 084	.5666	22'44'66' : 22'33'6: 22'355'	1.7451	1.4484
52	73.49	5:3	089	.5779	22'346'	0.0000	0.0000
53	73.69	5:2	101 090	.5814	22'34'5 : 22'455'	2.6727	2.2307
54	74.08	5:2	099	.5888	22'44'5	1.9507	1.6281
55	74.6	6:4 5:2	150 112	.5969	22'34'66' : 233'56 : 23'44'6	0.2960	0.2470
56	74.8	5:2	083 109	.6029	22'33'5 : 233'46	0.4628	0.3862
57	75.22	6:4 5:2	152 097	.6062	22'3566' : 22'345 : 22'3'45	0.7297	0.6014
58	75.55	5:2	087 111	.6175	22'345' : 233'55' : 2344'6	0.4774	0.3984
59	75.84	5:2	085 116	.6224	22'344' : 234567	0.3096	0.2584
60	76.12	6:4	136	.6257	22'33'66'	0.3831	0.2891
61	76.33	4:0 5:2	077 110	.6295	33'44' : 233'4'6	4.2425	3.9408
62	76.7	6:3	154	.6349	22'44'56'	0.0813	0.0614
63	77	5:2	082	.6453	22'33'4	0.1692	0.1412
64	77.5	6:3	151	.6499	22'355'6	0.4491	0.3390
65	77.8	6:3 5:1	135 124	.6563	22'33'56' : 2'344'5	0.3820	0.2969
66	77.9	6:3	144	.6584	22'345'6	0.0000	0.0000
67	78	5:1 6:3	107 108	.6620	233'4'5 : 233'45' : 22'34'56	0.4345	0.3514
68	78.25	5:1	123	.6658	2'344'5	0.0000	0.0000
69	78.4	6:3 5:1	149 118	.6672	22'34'5'6 : 23'44'5 : 233'45	3.7356	2.9027
70	78.55	6:3	139 140	.6707	22'344'6 : 22'344'6'	0.0000	0.0000
71	79.2	6:3 5:1	134 143	.6796	22'33'56' : 22'3456': 2344'5	0.2338	0.1911
72	79.5	5:1 6:3	122 131	.6871	2'33'45: 22'33'46:22'33'55'+	0.0829	0.0664
73	80	6:2	146 161	.6955	22'34'55' : 233'45'6	0.4093	0.3089
74	80.3	6:3 5:1	132 105	.7035	22'33'46' : 233'44'	0.5132	0.4237
75	80.5	6:2	153	.7036	22'44'55'	3.0922	2.3340
76	81.3	6:2	168	.7068	23'44'5'6	0.0310	0.0234
77	81.5	6:2	141	.7203	22'3455'	0.1506	0.1137
78	81.7	7:4	179	.7205	22'33'566'	0.1141	0.0786
79	82	6:2	130	.7204	22'33'45'	0.1748	0.1319
80	82.2	6:2	137	.7329	22'344'5	0.2734	0.2064
81	82.35	7:4	176	.7309	22'33'466'	0.0000	0.0000
82	82.7	6:2	138 163	.7483	22'344'5' : 233'4'56 : +2	1.6302	1.2345
83	83.1	6:2	158	.7429	233'44'6	0.2458	0.1856
84	83.5	6:2	129	.7501	22'33'45	0.1203	0.0908
85	83.9	7:3	178	.7537	22'33'55'6	0.0533	0.0367
86	84.2	6:2	166	.7572	2344'56	0.0100	0.0075
87	84.8	7:3	175	.7611	22'33'45'6	0.0182	0.0126
88	84.7	7:3	187 182	.7658	22'34'55'6 : 22'344'56'	0.2093	0.1443
89	85.1	6:2	128	.7761	22'33'44'	0.3452	0.2606
90	85.4	7:3	183	.7720	22'344'5'6	0.0000	0.0000
91	85.8	6:1	167	.7814	23'44'55'	0.2121	0.1601
92	86.4	7:3	185	.7848	22'3455'6	0.0191	0.0132
93	87	7:3	174 181	.7968	22'33'456' : 22'344'56	0.1405	0.0970
94	87.57	7:3	177	.8031	22'33'4'56	0.0000	0.0000
95	88	7:3 6:1	171 156	.8185	22'33'44'6 : 233'44'5	0.2966	0.2177
96	88.44	8:4	202	.8009	22'33'55'66'	0.0000	0.0000
97	88.5	6:1	157	.8104	233'44'5'	0.0361	0.0273
98	88.8	7:3	173	.8158	22'33'456	0.0025	0.0018
99	89.36	8:4	200 204	.8197	22'33'45'66' : 22'344'566'	0.0000	0.0000
100	89.6	7:2	172 192	.8270	22'33'455' : 233'455'6	0.0516	0.0356
101	90.2	8:4	197	.8298	22'33'44'66'	0.0000	0.0000
102	90.4	7:2	180	.8368	22'344'55'	0.2001	0.1986
103	90.8	7:2	193	.8397	233'4'55'6	0.0086	0.0059
104	91.44	7:2	191	.8447	233'44'5'6	0.0000	0.0000
105	92.2	8:4	199	.8494	22'33'4566'	0.0196	0.0124
106	93.9	7:2	170	.8740	22'33'44'5	0.1690	0.1170
107	94.4	7:2	190	.8740	233'44'56	0.0506	0.0349
108	95.63	8:3	198	.8849	22'33'455'6	0.0000	0.0000
109	95.9	8:3	201	.8875	22'33'4'55'6	0.0560	0.0355
110	96.8	8:3	196 203	.8939	22'33'44'5'6 : 22'344'55'6	0.0690	0.0437
111	98.72	7:1	189	.9148	233'44'55'	0.0000	0.0000
112	101.23	8:3	195	.9381	22'33'44'56	0.0000	0.0000
113	101.87	9:4	208	.9328	22'33'455'66'	0.0000	0.0000
114	103.29	9:4	207	.9428	22'33'44'566'	0.0000	0.0000
115	105.3	8:2	194	.9620	22'33'44'55'	0.0594	0.0351
116	106.77	8:2	205	.9670	233'44'55'6	0.0000	0.0000
117	114.2	9:3	206	1.010	22'33'44'55'6	0.0644	0.0378
118	126.38	10:4	209	1.050	22'33'44'55'66'	0.0000	0.0000

CONCENTRATION = 2.321519
TOTAL MICROMOLLS = 0.0085

AVERAGE MOLECULAR WEIGHT = 272.41290
NUMBER OF CALIBRATED PEAKS FOUND = 118

N.B.
26B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MT32:NB263.ALS

N.B. 26B

17

PEAK#	RET. TIME	T-CL:O-CL	IUPAC#	RRT	CONGENERS	WEIGHT %	MOLE %
1	40.81	0:0	000	.0997	BIPHENYL	0.0000	0.0000
2	46.62	1:1	001	.1544	2	29.6481	37.[illegible]1
3	50.35	1:0	002	.1937	3	6.8356	[illegible]
4	50.61	1:0	003	.1975	4	0.2106	0.2695
5	52.34	2:2	004 010	.2243	22' + 26	0.4210	0.4550
6	54.73	2:1	007 009	.2566	24 + 25	0.1146	0.1241
7	55.50	2:1	006	.2709	23'	0.7939	0.8595
8	56.1	2:1	005 008	.2785	23 + 24'	1.1270	1.2201
9	57.47	2:0	014	.2973	35	0.1903	0.2147
10	57.70	3:3	019	.3045	22'6	0.3132	0.2930
11	58.74	3:2	030	.3165	246	0.0340	0.0319
12	59.20	2:0	011	.3230	33'	0.1553	0.1681
13	59.49	2:0	012 013	.3297	34 + 34'	0.2576	0.2789
14	59.75	3:2 2:0	018 015	.3307	22'5 + 44'	4.9873	4.8732
15	60.01	3:2	017	.3390	22'4	1.0300	0.9669
16	60.73	3:2	024 027	.3500	236 + 23'6	0.1540	0.1445
17	61.30	3:2	016 032	.3625	22'3 + 24'6	0.7305	0.6852
18	62.13	3:1	023	.3770	235	2.5102	2.3545
19	62.37	3:1 4:4	034 054	.3800	2'35 + 22'66'	0.0612	0.0552
20	62.75	3:1	029	.3820	245	2.8411	2.6649
21	63.01	3:1	026	.3911	23'5	1.0190	0.9558
22	63.19	3:1	025	.3957	23'4	1.7049	1.5992
23	63.63	3:1	031	.4024	24'5	2.1175	1.9862
24	63.74	3:1 4:3	028 050	.4031	244' + 22'46	2.8142	2.6326
25	64.54	3:1 4:3	021 053	.4170	233' + 234 + 22'56'	1.0799	0.9148
26	65.01	3:1 4:3	022 051	.4267	234' + 22'46'	0.6549	0.5831
27	65.5	4:3	045	.4334	22'36	0.2764	0.2286
28	65.84	3:1	036	.4379	33'5	0.0000	0.0000
29	66.07	4:3	046	.4450	22'36'	0.7521	0.6221
30	66.45	3:1	039	.4488	34'5	0.0000	0.0000
31	66.64	4:2	052 073	.4554	22'55' + 23'5'6	2.7489	2.2737
32	67	4:2	049	.4610	22'45	2.4144	1.9970
33	67.23	4:2	047	.4639	22'44'	1.1045	0.9136
34	67.36	4:2	048 075	.4651	22'45 + 244'6	0.4792	0.3964
35	67.52	4:2	065 062	.4665	2346 + 2356	0.0817	0.0676
36	67.78	3:0	035	.4738	33'4	0.1737	0.1629
37	68.17	5:4 4:2	104 044	.4832	22'466' + 22'35'	1.4292	1.1808
38	68.4	3:0 4:2	037 042	.4870	344' + 22'34' + 233'6	1.6020	1.3367
39	69.1	4:2	064 071	.4990	23'34 + 234'6 + 23'4'6 +	1.3605	1.1253
40	69.25	4:1	068	.5044	23'45' 7	0.0000	0.0000
41	69.4	5:4	096	.5057	22'366'	0.4751	0.3516
42	69.7	4:2	040	.5102	22'33'	0.2756	0.2279
43	70.1	5:3 4:1	103 057	.5155	22'45'6 + 233'5	0.1774	0.1435
44	70.5	5:3 4:1	100 067	.5212	22'44'6 + 23'4'5	0.2626	0.2020
45	70.8	4:1	058 063	.5267	233'5' + 234'5	0.1112	0.0920
46	71.1	4:1 5:3	074 094	.5340	244'5 + 22'356'	0.7880	0.6093
47	71.3	4:1	070 061	.5407	23'4'5 + 2'345 + 24457	1.5419	1.2754
48	71.6	4:1 5:3	066 095	.5447	23'44' + 22'356 + 22'35'6	2.0262	1.5060
49	72.2	5:3 4:1	091 098	.5549	22'34'6 + 22'3'46 + 233'4	0.7043	0.5266
50	72.8	4:1	056 060	.5676	233'4' + 2344'	1.0782	0.8919
51	73.2	6:4 5:3	155 084	.5666	22'44'66' + 22'33'6; 22'356'	0.8431	0.6204
52	73.6	5:3	089	.5779	22'346'	1.6952	1.2544
53	73.71	5:2	101 090	.5814	22'34'5 + 22'455'	0.0000	0.0000
54	74.1	5:2	099	.5880	22'44'5	1.4225	1.0524
55	74.6	6:4 5:2	150 112	.5969	22'34'66' + 233'56 + 23'44'6	0.1584	0.1172
56	74.8	5:2	083 109	.6029	22'33'5 + 233'46	0.1986	0.1470
57	75.2	6:4 5:2	152 097	.6062	22'3566' + 22'345 + 22'3'45	0.5662	0.4164
58	75.5	5:2	087 111	.6175	22'345' + 233'55' + 2344'6	0.4012	0.2969
59	75.8	5:2	085 116	.6224	22'344' + 234567	0.2875	0.2127
60	76.1	6:4	136	.6257	22'33'66'	0.2118	0.1418
61	76.3	4:0 5:2	077 110	.6295	33'44' + 233'4'6	2.2266	1.6476
62	76.7	6:3	154	.6349	22'44'56'	0.0742	0.0497
63	77	5:2	082	.6453	22'33'4	0.1401	0.1037
64	77.5	6:3	151	.6499	22'355'6	0.2693	0.1802
65	77.8	6:3 5:1	135 124	.6563	22'33'56' + 2'344'5	0.2514	0.1732
66	77.9	6:3	144	.6584	22'345'6	0.0000	0.0000
67	78	5:1 6:3	107 108	.6628	233'4'5 + 233'45' + 22'34'56	0.2791	0.2001
68	78.25	5:1	123	.6650	2'344'5	0.0000	0.0000
69	78.4	6:3 5:1	149 118	.6672	22'34'5'6 + 23'44'5 + 233'45	2.5634	1.7660
70	78.55	6:3	139 140	.6707	22'344'6 + 22'344'6'	0.0000	0.0000
71	79.2	6:3 5:1	134 143	.6796	22'33'56' + 22'3456'; 2344'5	0.1604	0.1220
72	79.4	5:1 6:3	122 131	.6871	2'33'45; 22'33'46;22'33'55'+	0.0293	0.0208
73	80	6:2	146 161	.6955	22'34'55' + 233'45'6	0.2792	0.1869
74	80.3	6:3 5:1	132 105	.7035	22'33'46' + 233'44'	0.4204	0.3070
75	80.5	6:2	153	.7036	22'44'55'	2.2200	1.4862
76	81.3	6:2	168	.7060	23'44'5'6	0.0242	0.0162
77	81.5	6:2	141	.7203	22'3455'	0.1290	0.0863
78	81.7	7:4	179	.7205	22'33'566'	0.0797	0.0487
79	82.1	6:2	130	.7284	22'33'45'	0.1132	0.0758
80	82.2	6:2	137	.7329	22'344'5	0.1824	0.1221
81	82.35	7:4	176	.7385	22'33'466'	0.0000	0.0000
82	82.7	6:2	138 163	.7408	22'344'5' + 233'4'56 + +2	1.0849	0.7261
83	83.1	6:2	158	.7429	233'44'6	0.1796	0.1202
84	83.4	6:2	129	.7501	22'33'45	0.0952	0.0637
85	83.9	7:3	178	.7537	22'33'55'6	0.0450	0.0280
86	84.2	6:2	166	.7572	2344'56	0.0109	0.0073
87	84.5	7:3	175	.7611	22'33'45'6	0.0164	0.0102
88	84.7	7:3	187 182	.7653	22'34'55'6 + 22'344'56'	0.1720	0.1056
89	85.1	6:2	128	.7761	22'33'44'	0.2563	0.1715
90	85.3	7:3	183	.7720	22'344'5'6	0.0118	0.0072
91	85.7	6:1	167	.7814	23'44'55'	0.1867	0.1249
92	86.4	7:3	185	.7848	22'3455'6	0.0186	0.0114
93	87	7:3	174 181	.7965	22'33'456' + 22'344'56	0.1164	0.0713
94	87.5	7:3	177	.8031	22'33'4'56	0.0939	0.0575
95	88	7:3 6:1	171 156	.8105	22'33'44'6 + 233'44'5	0.2369	0.1541
96	88.44	8:4	202	.8089	22'33'55'66'	0.0000	0.0000
97	88.5	6:1	157	.8104	233'44'5'	0.0338	0.0226
98	88.9	7:3	173	.8152	22'33'456	0.0006	0.0004
99	89.46	8:4	200 204	.8197	22'33'45'66' + 22'344'566'	0.0000	0.0000
100	89.6	7:2	172 192	.8270	22'33'455' + 233'455'6	0.0596	0.0364
101	90.2	8:4	197	.8293	22'33'44'66'	0.0000	0.0000
102	90.49	7:2	180	.8362	22'344'55'	0.0000	0.0000
103	90.8	7:2	193	.8397	233'4'55'6	0.0081	0.0049
104	91.3	7:2	191	.8447	233'44'5'6	0.0034	0.0021
105	92.2	8:4	199	.8494	22'33'4566'	0.0231	0.0130
106	93.9	7:2	170	.8740	22'33'44'5	0.1337	0.0817
107	94.4	7:2	190	.8748	233'44'56	0.0429	0.0262
108	95.2	8:3	198	.8845	22'33'455'6	0.0000	0.0000
109	95.9	8:3	201	.8875	22'33'4'55'6	0.0524	0.0295
110	96.7	8:3	196 203	.8935	22'33'44'5'6 + 22'344'55'6	0.0559	0.0314
111	98.6	7:1	189	.9142	233'44'55'	0.0084	0.0052
112	101.1	8:3	195	.9321	22'33'44'56	0.0345	0.0194
113	101.8	9:4	208	.9320	22'33'455'66'	0.0054	0.0028
114	103.2	9:4	207	.9423	22'33'44'566'	0.0010	0.0005
115	105.3	8:2	194	.9620	22'33'44'55'	0.0441	0.0248
116	106.5	8:2	205	.9678	233'44'55'6	0.0009	0.0005
117	114.2	9:3	206	1.010	22'33'44'55'6	0.0533	0.0277
118	126.35	10:4	209	1.050	22'33'44'55'66'	0.0300	0.0066

CONCENTRATION = 2.523900
TOTAL MICROMOLES = 0.0184

AVERAGE MOLECULAR WEIGHT = 241.52687
NUMBER OF CALIBRATED PEAKS FOUND = 118

Table 3. PCB Levels, Distributions, and Alteration States in Subsurface Sediments of the Upper Acushnet River Estuary, New Bedford, MA

No.,[a] side W[b]	E[c]	Latitude (41°N)	Sample texture[d]	Total oils, ppm[e]	Total PCBs, ppm[e]	Orig. 1242: 1254	Soln. loss (%)	Dechlor'n Status Pattern	half-losses[f] P50	P58	58-5
-	19A	40'30"	sft mud	20,000	1,637	68:32	40	H	2.5	3.1	0.6
-	19B	40'30"	sft mud	28,400	1,126	57:43	40[g]	H	3.2	3.5	0.3
-	18A	40'30"	snd	20,700	3,285	05:95	5	H?	~0.0	0.6	0.6
-	18B	40'30"	snd	7,040	739	06:94	6	H?	~0.1	0.8	0.7
-	21A	40'26"	gr, snd	11,100	3,775	47:53	4	H	1.9	2.2	0.3
-	21B	40'26"	gr, snd	1,400	417	40:60	5	H	2.0	2.2	0.2
17A	-	40'21"	sft mud	46,300	3,292	80:20	9	H	0.8	2.3	1.5
17B	-	40'21"	sft mud	40,300	3,724	70:30	12	H	1.9	3.2	1.3
-	22A	40'16"	snd	5,390	765	81:19	33[h]	H	2.3	3.1	0.8
-	22B	40'16"	snd	8,110	1,444	64:32	14	H	1.9	3.5	1.6
14A	-	40'16"	snd, mud	3,840	40.4	74:26	34	H	0.9	1.6	0.7
14B	-	40'16"	snd, mud	3,390	0.9	~76:24	-	H?	~0.7	~0.8	-
12A	-	40'14"	gr, snd	8,730	505	84:16	11	H'	2.1	1.6	-0.5
12B	-	40'14"	gr, snd	6,070	526	82:18	51	H'	3.1	2.3	-0.8
-	24A	40'12"	gr, snd	<150	0.7	~70:30	-	H?	~0.6	~1.6	-
-	24B	40'12"	gr, snd	<150	0.3	~65:35	-	H?	~0.9	~1.6	-
9A	-	40'11"	gr, mud	26,700	490	94:06	8	H'	1.9	1.0	-0.9
9B	-	40'11"	gr, mud	22,900	1,135	91:09	30	H'	2.7	1.8	-0.9
5A	-	40'01"	gr, snd	12,800	304	82:18	44[h]	H	1.2	1.1	-0.1
5B	-	40'01"	gr, snd	34,500	785	86:14	22	H	2.3	1.4	-0.9
2A	-	39'55"	gr, snd	1,570	150	71:29	29	H	0.9	0.7	-0.2
2B	-	39'55"	gr, snd	2,050	171	67:33	22	H	2.3	1.6	-0.7
-	26A	39'39"	fiber	<440	3.2	~54:46	-	H	~1.3	~1.9	-
-	26B	39'39"	fiber	<370	0.6	~64:36	-	H?	~0.5	~1.3	-
Average for all sites:				13,000	1,013	61:39	18	-	1.6	1.6	0.0

a. Depth of "A: samples 5-7.5 cm; of "B" samples 15-17.5 cm.

b. Sites located on west side of estuary, 70°55'06-09" W.

c. Sites located on east side of estuary, 70°54'51-59" W.

d. Key: sft, soft black mud, H_2S odor; snd, sand; gr, gravel; fiber, apparently spartina root mass (marsh bed).

e. Parts per million of air-dried sediment weight.

f. $-Log_2$ fractional retention of peak 50 (mainly 23-34 CB from Aroclor 1242) or of peak 58 (mainly 234-25 CB from Aroclor 1254), or differences between these numbers of half-losses.

g. This calculated value probably an underestimate.

h. This calculated value probably an overestimate.