

07/08/1980

VOC330708801

Category: 33 – Definition of VOC

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

DATE: JUL 8 1980

SUBJECT: Classification of Benzene as a VOC

FROM: Walter C. Barber, Director
Office of Air Quality Planning and Standards (MD-10)

TO: Stephen Wassersug, Director
Air and Hazardous Materials Division, Region III

This is in response to your memorandum of June 12, 1980 concerning the classification of benzene as a volatile organic compound (VOC).

Benzene has been listed as a hazardous pollutant as defined in Section 112 of the Clean Air Act as amended (see 42 FR 29332, dated June 8, 1977). At this time, it is our belief that benzene emissions from chemical manufacturing facilities, petroleum refineries, and coke ovens should be reduced and national emission standards are being developed for these industrial categories.

It is prudent to regulate benzene from coke oven by-product recovery plants as Maryland appears to be doing. Also, a "NESHAP" is being prepared by EPA for the coke by-product facilities including the storage of benzene. This "NESHAP" will also provide regulation where the current fixed roof and floating roof CTGs did not apply (i.e., nonpetroleum liquid storage).

Benzene has been indicated as having only negligible photochemical reactivity (see policy, 42 FR 39314). However, emissions of benzene are of concern to EPA from a hazardous standpoint; and, as such, it would be inappropriate for EPA to take any action at this time which would encourage uncontrolled emissions of benzene. Accordingly, I suggest that we adhere to the reactivity policy and take no action to exclude benzene at this time.

Please contact G. T. Helms, CPDD (FTS 629-5226), should you have any questions.

bcc: D. Hawkins
T. Kaneen

NOTE: Please see Federal Register, Vol. 42, No. 131, 7/8/77, Part III, Air Quality, "Recommended Policy on Control of Volatile Organic Compounds".

NOTE: Please see Federal Register, Vol. 42, No. 110, 6/8/77, Pages 29332 to 29333.

ENVIRONMENTAL PROTECTION AGENCY

[FRL 729-5]

AIR QUALITY

Recommended Policy on Control of Volatile Organic Compounds

PURPOSE

The purpose of this notice is to recommend a policy for States to follow on the control of volatile organic compounds (VOC), which are a constituent in the formation of photochemical oxidants (smog). This notice does not place any requirements on States; State Implementation Plan (SIP) provisions which offer reasonable alternatives to this policy will be approvable. However, this policy will be followed by EPA whenever it is required to draft State Implementation Plans for the control of photochemical oxidants.

BACKGROUND

Photochemical oxidants result from sunlight acting on volatile organic compounds (VOC) and oxides of nitrogen. Some VOC, by their nature, start to form oxidant after only a short period of irradiation in the atmosphere. Other VOC may undergo irradiation for a longer period before they yield measurable oxidant.

In its guidance to States for the preparation, adoption, and submittal of State Implementation Plans published in 1971, the Environmental Protection Agency emphasized reduction of total organic compound emissions, rather than substitution. (See 40 CFR Part 51, Appendix B.) However, in Appendix B, EPA stated that substitution of one compound for another might be useful where it would result in a clearly evident decrease in reactivity and thus tend to reduce photochemical oxidant formation. Subsequently, many State Implementation Plans were promulgated with solvent substitution provisions similar to Rule 66 of the Los Angeles County Air Pollution Control District. These regulations allowed exemptions for many organic solvents which have now been shown to generate significant photochemical oxidant.

On January 29, 1976, EPA published its "Policy Statement on Use of the Concept of Photochemical Reactivity of Organic Compounds in State Implementation Plans for Oxidant Control." The notice of availability of this document appeared in the FEDERAL REGISTER on February 5, 1976 (41 FR 5350).

The 1976 policy statement emphasized that the reactivity concept was useful as an interim measure only, and would not be considered a reduction in organic emissions for purposes of estimating attainment of the ambient air quality standard for oxidants. The document also included the following statement:

Although the substitution portions of Rule 66 and similar rules represent a workable and acceptable program at the present time, better substitution regulations can be developed, based on current knowledge of re-

activity and industrial capability. EPA in collaboration with State and industry representatives will formulate in 1976 an improved rule for national use.

SUMMARY

Analysis of available data and information show that very few volatile organic compounds are of such low photochemical reactivity that they can be ignored in oxidant control programs. For this reason, EPA's recommended policy reiterates the need for positive reduction techniques (such as the reduction of volatile organic compounds in surface coatings, process changes, and the use of control equipment) rather than the substitution of compounds of low (slow) reactivity in the place of more highly (fast) reactive compounds. There are three reasons for this. First, many of the VOC that previously have been designated as having low reactivity are now known to be moderately or highly reactive in urban atmospheres. Second, even compounds that are presently known to have low reactivity can form appreciable amounts of oxidant under multiday stagnation conditions such as occur during summer in many areas. Third, some compounds of low or negligible reactivity may have other deleterious effects.

Of the small number of VOC which have only negligible photochemical reactivity, several (benzene, acetonitrile, chloroform, carbon tetrachloride, ethylene dichloride, ethylene dibromide, and methylene chloride) have been identified or implicated as being carcinogenic, mutagenic, or teratogenic. An additional compound, benzaldehyde, while producing no appreciable ozone, nevertheless, forms a strong eye irritant under irradiation. In view of these circumstances, it would be inappropriate for EPA to encourage or support increased utilization of these compounds. Therefore, they are not recommended for exclusion from control. Only the four compounds listed in Table 1 are recommended for exclusion from SIP regulations and, therefore, it is not necessary that they be inventoried or controlled. In determining reductions required to meet oxidant NAAQS, these VOC should not be included in the base line nor should reductions in their emission be credited toward achievement of the NAAQS.

It is recognized that the two halogenated compounds listed in Table 1 (methyl chloroform and Freon 113) may cause deterioration of the earth's ultraviolet radiation shield since they are nearly unreactive in the lower atmosphere and all contain appreciable fractions of chlorine. The Agency has reached conclusions on the effects of only the fully halogenated chlorofluoroalkanes. The Agency on May 13, 1977 (42 FR 24542), proposed rules under the Toxic Substances Control Act (TSCA) to prohibit the nonessential use of fully halogenated chlorofluoroalkanes as aerosol propellants. The restrictions were applied to all members of this class, including Freon 113, since they are potential substitutes for Freon 11, Freon 12,

Freon 114, and Freon 115, which are currently used as aerosol propellants. The Agency is planning to investigate control systems and substitutes for nonpropellant uses under TSCA, as announced on May 13. Methyl chloroform is not a fully halogenated chlorofluoroalkane. Rather, it is among the chlorine-containing compounds for which the Agency has not completed its analysis; EPA has not yet concluded whether it is or is not a threat to the stratospheric ozone. Therefore, it has been placed on this list as an acceptable exempt compound. As new information becomes available on these compounds, EPA will reconsider the recommendation.

The volatile organic compounds listed in Table 2, while more photochemically reactive than those in Table 1, nevertheless do not contribute large quantities of oxidant under many atmospheric conditions.

TABLE 1.—Volatile Organic Compounds of Negligible Photochemical Reactivity That Should Be Exempt From Regulation Under State Implementation Plans

Methane
Ethane
1,1,1-Trichloroethane (Methyl Chloroform) ¹
Trichlorotrifluoroethane (Freon 113) ¹

¹These compounds have been implicated as having deleterious effects on stratospheric ozone and, therefore, may be subject to future controls.

TABLE 2.—Volatile Organic Compounds of Low Photochemical Reactivity

Propane
Acetone
Methyl Ethyl Ketone
Methanol
Isopropanol
Methyl Benzoate
Tertiary Alkyl Alcohols
Methyl Acetate
Phenyl Acetate
Ethyl Amines
Acetylene
N, N-dimethyl formamide

Only during multiday stagnations do Table 2 VOC yield significant oxidants. Therefore, if resources are limited or if the sources are located in areas where prolonged atmospheric stagnations are uncommon, priority should be given to controlling more reactive VOC first and Table 2 organics later. Table 2 VOC are to be included in base line emission inventories and reductions in them will be credited toward achievement of the NAAQS. Reasonably available control technology should be applied to significant sources of Table 2 VOC where necessary to attain the NAAQS for oxidants. New sources of these compounds will also be subject to new source review requirements.

Perchloroethylene, the principal solvent employed in the dry cleaning industry, is also of low reactivity, comparable to VOC listed in Table 2. It was not included in Table 2 because of reported adverse health effects. Uses, environmental distribution, and effects of perchloroethylene currently are being studied intensively by occupational health authorities. Perchloroethylene currently are being studied intensively by occupational health authorities. Investigations may have major impact on

industrial users. In designing control regulations for perchloroethylene sources, particularly dry cleaners, consideration should be given to these findings as well as industry requirements and the cost of applying controls. Available control technology is highly cost effective for large perchloroethylene dry cleaning operations. However, for coin-operated and small dry cleaners, the same equipment would represent a heavy economic burden.

As part of its continuing program, EPA will review new information relative to the photochemical reactivity, toxicity, or effects on stratospheric ozone of volatile organic compounds. Where appropriate, additions or deletions will be made to the lists of VOC in Tables 1 and 2.

DISCUSSION

Most air pollution control regulations applicable to stationary sources of VOC in the United States are patterned after Rule 66 of the Los Angeles County Air Pollution Control District (presently Regulation 442 of the Southern California Air Pollution Control District). Rule 66 and similar regulations incorporate two basic strategies to reduce ambient oxidant levels, i.e., positive VOC reduction and selective solvent substitution based on photochemical reactivity. Positive reduction schemes such as incineration, absorption, and the use of low-solvent coatings are acknowledged means of reducing ambient oxidant levels; they should be retained in future VOC control programs. In contrast, the utility of solvent substitution strategies has been questioned as more information on photochemical reactivity has emerged.

EPA acknowledged the shortcomings of solvent substitution based on Rule 66 reactivity criteria in a 1976 policy statement (41 FR 5350). Findings were cited which indicated that almost all VOC eventually react in the atmosphere to form some oxidant. Concurrently, EPA initiated an investigation to consider implications of revising the solvent substitution aspects of Rule 66. Three separate forms were conducted with representatives of State and local air pollution control agencies, university professors, and industrial representatives with knowledge and expertise in the fields of atmospheric chemistry and industrial solvent applications. In addition, numerous discussions were held with acknowledged experts in the field. Topics of particular concern were:

Whether Rule 66 substitution criteria could be revised consistent with available reactivity data and yet be compatible with industrial processes and with product requirements.

Whether some compounds are of sufficiently low reactivity that they are not oxidant precursors and can be exempted from control under State Implementation Plans.

Whether the imposition of reactivity restrictions in addition to positive emission reductions will delay the development or implementation of promising technologies, particularly the use of water-borne and high-solids surface coatings.

Investigation showed that:

1. Solvent substitution based on Rule 66 has been directionally correct in the aggregate and probably effects some reductions in peak oxidant levels. However, because of the relatively high reactivity of most of the substituted solvents, the reduction is small compared to that which can be accomplished with positive reduction techniques. Revision of Rule 66 consistent with current knowledge of reactivity would eliminate the solvent substitution option for most sources in which substitution is now employed. Many of the organic solvents which have been categorized as having low photochemical reactivity are, in fact, moderately or highly reactive; they yield significant oxidant when subjected to irradiation in smog chambers designed to simulate the urban atmosphere.

2. A few VOC yield only negligible ozone when irradiated in smog chambers under both urban and rural conditions. Experiments conducted to date indicate that only methane and ethane, a group of halogenated paraffins, and three other organics—benzene, benzaldehyde, and acetonitrile—can be so classified. These compounds react very slowly yielding little ozone during the first few days following their release to the atmosphere. Available data suggest that none of the listed compounds contribute significant oxidant even during extended irradiation under multiday stagnation conditions.

The broad group "halogenated paraffins" includes important industrial solvents, most of which are chlorinated methanes and ethanes and chlorofluoroethanes. They find use as metal cleaning and dry cleaning solvents and as paint removers. Halogenated paraffins also serve as building blocks in the manufacture of other halogenated organics; these processes do not necessarily release significant VOC to the atmosphere.

3. Besides focusing on VOC of negligible reactivity, smog chamber studies show that a few additional VOC generate oxidant at a relatively slow rate. Under favorable atmospheric conditions, these VOC releases may not form oxidant until they have been transported substantial distances and become greatly diluted. However, under multiday stagnation conditions such as occur during summer in many areas of the middle and eastern United States, there is the potential for these organics to undergo appreciable conversion to oxidant. The more important VOC in this category are acetone, methyl ethyl ketone, perchloroethylene, methanol, isopropanol, and propane. All except propane are industrial solvents. The latter, a gas under normal conditions, is associated principally with crude oil and liquefied petroleum gas operations.

4. The vast number of volatile organic compounds—particularly nonhalogenated VOC—yield appreciable ozone when irradiated in the presence of oxides of nitrogen. While there are measurable variations in their rates of ozone formation, all are significantly more reactive than VOC listed in Table 2. Quickly reactive VOC include almost all aliphatic

and aromatic solvents, alcohols, ketones, glycols, and ethers.

5. Low photochemical reactivity is not synonymous with low biological activity. Some of the negligible or slowly reactive compounds have adverse effects on human health. Benzene, acetonitrile, carbon tetrachloride, chloroform, perchloroethylene, ethylene dichloride, ethylene dibromide, and methylene chloride have been implicated as being carcinogens, teratogens, or mutagens. In addition, benzaldehyde, which produces no appreciable ozone, nevertheless forms a strong eye irritant under irradiation. While their use might reduce ambient oxidant levels, it would be unwise to encourage their uncontrolled release. Additional halogenated organics are being investigated for possible toxicity.

Most of the related health information available at this time concerns acute toxicity. Threshold limit values (TLV's) have been developed for many VOC. They are appropriate for the healthy, adult work force exposed eight hours a day, five days a week. Experts suggest that more stringent levels should be established for the general population. Hazards represented by chronic and subchronic exposure are much more difficult to quantify than acute toxicity. Adverse health effects of the VOC cited above are generally recognized although not completely quantified. Chlorinated solvents currently are under intensive study.

6. Some VOC are of such low photochemical reactivity that they persist in the atmosphere for several years, eventually migrating to the stratosphere where they are suspected of reacting and destroying ozone. Since stratospheric ozone is the principal absorber of ultraviolet (UV) light, the depletion could lead to an increase in UV penetration with a resultant worldwide increase in skin cancer. The only in-depth analysis of this potential problem has focused on the chlorofluoromethanes (CFM), Freon 11 and Freon 12, because of their known stability and widespread use in aerosol containers. A report of the National Academy of Sciences concerning environmental effects of CFM's concluded that:

• • • selective regulation of CFM uses and releases is almost certain to be necessary at some time and to some extent of completeness.

In response to the report of the National Academy of Sciences and other studies, EPA on May 13, 1977 (42 FR 24542), proposed rules to prohibit nonessential usage of fully halogenated chlorofluoroalkanes as aerosol propellants. The restrictions were applied to all members of this class including Freon 113 since they are potential substitutes for Freon 11, Freon 12, Freon 114, and Freon 115 which are currently used as aerosol propellants.

Other stable halogenated solvents which are released in volumes comparable to the chlorofluoroalkanes also are suspected of depleting the earth's UV shield. Of major concern is the wide-

spread substitution of methyl chloroform (1,1,1 trichloroethane) for the photochemically reactive degreasing solvent trichloroethylene. Such substitution under Rule 66 generation regulations has already influenced industrial degreasing operations to the extent that methyl chloroform production has surpassed that of trichloroethylene in the United States. Any regulation in the area will have a marked effect on the production and atmospheric emissions of both solvents. Endorsing methyl chloroform substitution would increase emissions, particularly in industrial States that have not, heretofore, implemented Rule 66. On the other hand, disallowing methyl chloroform as a substitute or banning it altogether would significantly increase emissions of trichloroethylene even if degreasers were controlled to the limits of available technology. Presently, technology is only able to reduce emissions by approximately 50 percent. In metropolitan areas which have already implemented Rule 66, a return to trichloroethylene would have an adverse effect on ambient oxidant levels. In addition to being highly reactive, trichloroethylene has been implicated as a carcinogen.

Alternatives to the above-cited choices would be (1) development and application of highly efficient degreaser control systems and (2) replacement with an

intermediate solvent which is neither reactive nor detrimental to the upper atmosphere. Major revisions would be needed to degreaser designs to improve vapor capture above the current best level. Anticipated design changes could add materially to degreaser costs. No alternative solvent is clearly acceptable from the standpoints of photochemical oxidant and stratospheric ozone depletion. Neither methylene chloride nor trichlorotrifluoroethane are reactive, but, like methyl chloroform, are suspected of causing damage to the stratospheric ozone layer. In addition, methylene chloride is a suspect mutagen. Perchloroethylene, the principal dry cleaning solvent, does not present a hazard to the stratosphere but has been implicated as being a carcinogen and also reacts slowly in the atmosphere to form oxidant.

7. Organic solvents of low or negligible photochemical reactivity have only limited use in many industries. Most are chlorinated organics that find principal applications as cleaners for metals and fabrics. A few nonhalogenated VOC such as acetone, methyl ethyl ketone, and isopropanol are of low reactivity but these can't possibly satisfy all the myriad needs of the paint, plastics, pharmaceutical, or many other industries. While users of reactive VOC usually can employ effective control equipment to recover or

destroy VOC emissions, they seldom have the option of applying reactivity considerations in choosing solvents. Applying reactivity restrictions to the surface coating industry would be especially disadvantageous since it would greatly inhibit the development of low-solvent coatings; essentially all of the organic solvents used to constitute high-solids coatings and water-borne coatings are, in fact, highly reactive.

8. It is recognized that smog chamber studies conducted to date are incomplete because many organic compounds have not been examined and it has been impossible to duplicate all atmospheric situations. For example, there has been only limited examination of oxidant formation under relatively high ratios of VOC to NO_x (30:1 and greater), comparable to rural conditions. Any policy on photochemical reactivity necessarily has to be open to revision as new information is developed which may show specific organic compounds to be more or less photochemically reactive than indicated by current data.

Dated: June 29, 1977.

EDWARD F. TUERK,
Acting Assistant Administrator
for Air and Waste Management.

[FR Doc.77-10385 Filed 7-7-77; 8:45 am]

ALGAECIDE 30. Active Ingredients: Poly (oxyethylene(dimethyliminio) ethylene dichloride) 13.0%. Method of Support: Application proceeds under 2(b) of interim policy. PM34

EPA File Symbol 39743-R. Keystone Laboratories, Inc., PO Box 1367, Decatur AL 35602. **KEYCIDE 3500.** Active Ingredients: Alkyl (C12, 61%; C14, 23%; C16, 11%; C8 and C10, 2.5%; C18, 2.5%) dimethyl benzyl ammonium chloride 9.0%; Tributyltin neodecanoate 5.0%; Alkyl (C14, 58%; C16, 28%; C12, 14%) dimethyl benzyl ammonium chloride 4.5%; Alkyl (C14, 90%; C16, 5%; C12, 5%) dimethyl ethyl ammonium bromide 1.5%. Method of Support: Application proceeds under 2(b) of interim policy. PM33

EPA File Symbol 39838-R. Opal Pools by Opal Structure Inc., 2525 Old Okeechobee Rd., West Palm Beach FL 33409. **SODIUM HYPOCHLORITE.** Active Ingredients: Sodium Hypochlorite 9.2%. Method of Support: Application proceeds under 2(b) of interim policy. PM34

EPA File Symbol 40023-R. Dart Trading Co., PO Box 576, Forest Hills NY 11375. **DEVIL ROACH KILLER.** Active Ingredients: Boric Acid 49.0%. Method of Support: Application proceeds under 2(b) of interim policy. PM16

EPA File Symbol 40330-R. The Stevens Co., 118 North West St., Fairborn OH 45324. **M-103.** Active Ingredients: Poly[oxyethylene (dimethyliminio)ethylene (Dimethyliminio) ethylene dichloride] 12.0%. Method of Support: Application proceeds under 2(b) of interim policy. PM34

EPA File Symbol 40342-E. Precision Pools, Inc., 8 Curtis Pkwy., Miami Springs FL 33166. **PRECISION'S CHLORINATING SOLUTION.** Active Ingredients: Sodium Hypochlorite 9.0%. Method of Support: Application proceeds under 2(b) of interim policy. PM34

EPA File Symbol 40457-R. Omni-Chem Co., Inc., 1889 Mt. Diablo St., PO Box 335, Concord CA 94522. **D-C SAN-Q #1.** Active Ingredients: Didecyl dimethyl ammonium chloride 7.5%; Isopropanol 3.0%. Method of Support: Application proceeds under 2(b) of interim policy. PM31

EPA File Symbol 40457-G. Omni-Chem Co., Inc. **O-C SAN-Q #3 MICROBIOCIDES.** Active Ingredients: Didecyl dimethyl ammonium chloride 50%; Isopropyl alcohol 20%. Method of Support: Application proceeds under 2(b) of interim policy. PM31

EPA Reg. No. 275-27. Chemical Div., Abbott Laboratories, 14th & Sheridan Rd., D-495, North Chicago IL 60064. **AMICAL-50.** Active Ingredients: Diodomethyl paratolyl sulfone 75%. Method of Support: Application proceeds under 2(a) of interim policy. Republished: Added uses. PM22

EPA Reg. No. 352-372. E. I. duPont de Nemours and Co., Legal Dept. D7045, Attn. M. B. Lore, Wilmington DE 19898. **DU PONT VYDATE L OXAMYL INSECTICIDE/NEMATOCIDE.** Active Ingredients: Methyl N,N-dimethyl N[(methylcarbamoyl)oxy] 1-thioxamimidate 24%. Method of Support: Application proceeds under 2(b) of interim policy. Republished: Added use. PM12

EPA File Symbol 778-UR. Miller-Morton Co., Richmond VA 23230, A Subsidiary of A. H. Robins Co. **SERGEANT'S SENTRY IV FLEA & TICK COLLAR FOR CATS.** Active Ingredients: Sengard (1,2-dibromo-2, 2-dichloroethyl dimethyl phosphate) 7.0%; O-Isopropoxyphenyl methylcarbamate 2.4%. Method of Support: Application proceeds under 2(b) of interim policy. PM16

EPA File Symbol 778-UE. Miller-Morton Co. **SERGEANT'S SENTRY IV FLEA & TICK**

COLLAR FOR DOGS. Active Ingredients: Sengard (1,2-dibromo-2, 2-dichloroethyl dimethyl phosphate) 15.0%; O-Isopropoxyphenyl methylcarbamate 4.2%. Method of Support: Application proceeds under 2(b) of interim policy. PM16

EPA Reg. No. 891-178. Agricultural Chemicals, Synthetics Dept., Hercules Inc. Wilmington DE. **HERCULES TORAK F EMULSIFIABLE CONCENTRATE INSECTICIDE.** Active Ingredients: Dialifor O,O-diethyl S-(2-chloro-1-phthalimidoethyl) phosphorodithioate] 40.5%; Related reaction products 4.5%. Method of Support: Application proceeds under 2(b) of interim policy. PM16

EPA File Symbol 869-RAG. Green Light Co., PO Box 17985, San Antonio TX 78217. **GREEN LIGHT VEGETABLE GARDEN WORM KILLER DUST.** Active Ingredients: Bacillus thuringiensis, Berliner, Potency of 320 International units per MG. (0.15 billion International units per pound). Method of Support: Application proceeds under 2(b) of interim policy. PM17

EPA File Symbol 9601-RR. Chardon Laboratories, Inc., PO Box 1004, Columbus OH 43216. **ALGEX 30.** Active Ingredients: Didecyl dimethyl ammonium chloride 50%; Isopropyl alcohol 20%. Method of Support: Application proceeds under 2(b) of interim policy. PM31

EPA File Symbol 34164-U. American Refining & Mfg. Inc. 2375 N.W. 75th St., Miami FL 33147. **A & S 350.** Active Ingredients: Didecyl dimethyl ammonium chloride 50%; Ethyl alcohol 10%. Method of Support: Application proceeds under 2(b) of interim policy. PM31

EPA File Symbol 35978-E. Wyoming Dept. of Agriculture, 2219 Carey Ave., Cheyenne WY 82002. **WC90.** Active Ingredients: Sodium Monofluoroacetate 90.00%. Method of Support: Application proceeds under 2(b) of interim policy. PM11

[FR Doc.77-16100 Filed 6-7-77;8:45 am]

[732-2]

NATIONAL EMISSION STANDARDS FOR HAZARDOUS-AIR POLLUTANTS

Addition of Benzene to List of Hazardous Air Pollutants

AGENCY: Environmental Protection Agency (EPA).

ACTION: Addition to List of Hazardous Air Pollutants.

SUMMARY: This notice adds benzene to the list of pollutants determined to be hazardous as defined under Section 112 of the Clean Air Act, as amended. It is based on scientific reports which strongly suggest an increased incidence of leukemia in humans exposed to benzene.

This notice also announces EPA's intention to undertake a thorough public review of the scientific data to determine the health risks resulting from exposure to ambient concentrations of benzene. The results of this review, which will consider information submitted by all interested persons, will be used in determining which sources of benzene emissions must be controlled, and the extent of control needed.

DATES: Effective date of listing: Effective on June 8, 1977. Information on health effects of benzene exposure and ambient concentrations required by: July 30, 1977.

ADDRESSES: Information (preferably in triplicate) on the health effects of benzene exposure and ambient concentrations should be submitted to Dr. Roger Cortesi, Environmental Protection Agency, RD-683, Washington, D.C. 20460.

FOR FURTHER INFORMATION CONTACT:

Joseph Padgett, Strategies and Air Standards Division, Environmental Protection Agency, MD-12, Research Triangle Park, North Carolina 27711. Telephone No. (919) 688-8146, Ext. 204.

SUPPLEMENTARY INFORMATION: On April 14, 1977, the Environmental Defense Fund petitioned EPA to list benzene as a hazardous air pollutant under Section 112 of the Clean Air Act. Benzene is an organic chemical known to cause or contribute to adverse health effects at high levels of exposure.¹ Scientific reports strongly suggest an increased incidence of leukemia in workers exposed to benzene.² In response to these data, which include a recent (April, 1977) National Institute for Occupational Safety and Health study indicating high levels of leukemia in exposed workers,³ the Occupational Safety and Health Administration has proposed to reduce allowable work place exposure levels.⁴ Based on the reports cited above, the EPA Administrator has determined that benzene is a hazardous air pollutant which may cause, or contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness.

Benzene is produced and used in large quantities throughout the United States and a large number of people are routinely exposed to measurable concentrations of benzene in the ambient air. While these ambient exposures are, at levels substantially lower than those to which affected workers were exposed, there is reason to believe that ambient exposures may constitute a cancer risk and should be reduced.

Approximately 11 billion pounds of benzene were produced in the United States in 1976. Of this total it is estimated that as much as 260 million pounds may be emitted to the air. The principal sources of benzene emissions are chemical manufacturing facilities, petroleum refineries, gasoline storage and handling facilities, coke ovens, and automobiles.

¹ Health Effects of Benzene: A Review, National Academy of Sciences, Washington, D.C. June, 1976.

² Update Criteria and Recommendations for a Revised Benzene Standard, U.S. Department of Health, Education, and Welfare, Public Health Service, Center for Disease Control, National Institute for Occupational Safety and Health, September, 1976.

³ "Leukemia Among Workers Exposed to Benzene," National Institute for Occupational Safety and Health, Cincinnati, Ohio, April, 1977.

⁴ 42 FR 22516, May 3, 1977.

EPA has adopted a regulatory policy which recognizes that some risk exists at any level of exposure to carcinogenic chemicals. Under this policy, emissions and resultant ambient concentrations should be reduced to the lowest possible level. In making a judgment of the degree of control which can and should be required for benzene, the Administrator of EPA will consider the availability of control technology and the relative risk to the public before and after emission controls are employed.

The listing of benzene under Section 112 of the Clean Air Act identifies benzene as a hazardous air pollutant which may cause or contribute to irreversible or incapacitating adverse health effects. EPA is initiating a careful evaluation of the risks implied by ambient exposures to benzene. All persons are invited to submit information by July 30, 1977, on the health effects of benzene exposure and ambient atmospheric concentrations. This information will be considered in a health risk assessment, to be completed by November, 1977, which will be developed by EPA in consultation with scientific experts from outside the Agency. A draft of this assessment will be reviewed by the EPA Science Advisory Board and the interested public.

The listing of a compound as a hazardous air pollutant under Section 112 of the Clean Air Act requires the proposal of emission regulations within six months. Recent EPA experience in developing and promulgating regulations under Section 112 to control vinyl chloride emissions indicates that this schedule may not be feasible. Also, completion of the previously described health risk assessment is considered essential before a responsible determination can be made as to which sources of benzene emissions must be controlled, and the extent of control needed. However, EPA already has tentatively concluded that emission reductions from some chemical manufacturing facilities, petroleum refineries, and coke ovens may be necessary. Work already in process to develop data on adequate control technology for these sources is being expanded to permit the proposal of emission control regulations as soon as possible after completion of the health risk assessment. The dates for the proposal of regulations will be announced upon completion of the health risk assessment and identification of sources to be controlled.

The Agency has a wide range of regulatory authorities available which could be used other than Section 112. The Administrator interprets Section 112 to permit the Agency to control some sources of a listed hazardous air pollutant under other statutes or other sections of the Clean Air Act if appropriate. The Agency will make a serious examination of the extent to which the Toxic Substances Control Act or other authorities may be used either in addition to, or instead of, the Clean Air Act to achieve reductions in exposures to benzene.

After evaluating available information, the EPA Administrator has concluded that benzene is a "hazardous air pollutant" as defined in Section 112 of

the Clean Air Act, as amended. In reaching this decision, EPA already has consulted with OSHA, NIOSH, and the National Center for Toxicological Research, and also plans to consult with other appropriate Federal departments and agencies, advisory committees, and independent experts. Accordingly, notice is given that the Administrator, pursuant to Section 112(b) (1) (A) of the Act, effective on (date of publication), amends the list of hazardous air pollutants to read as follows:

LIST OF HAZARDOUS AIR POLLUTANTS

5. Benzene.

Dated: June 1, 1977.

DOUGLAS M. COSTLE,
Administrator.

[FR Doc.77-16204 Filed 6-7-77; 8:45 am]

[FRL 742-4; OPP-30133]

PESTICIDE PROGRAMS

Receipt of Application To Register a Pesticide Product Containing a New Active Ingredient

Armak Co., 300 S. Wacker, Chicago, IL 60606, has submitted to the Environmental Protection Agency (EPA) an application to register the pesticide product ARQUAD DMCB (EPA File Symbol 6922-RI), containing 80% of the active ingredient N-alkyl dimethylbenzyl ammonium chloride (alkyl groups C12-57%, C14-18%, C16-8%, C10-6%, C8-6%, and C8-5%), which has not been included in any previously registered pesticide products. The application received from Armak Co. proposes that the product be classified for general use as a disinfectant, sanitizing algicide. PM31

Notice of receipt of this application does not indicate a decision by the Agency on the application. Interested persons are invited to submit written comments on this application to the Federal Register Section, Technical Services Division (WH-569), Office of Pesticide Programs, Environmental Protection Agency, Rm. 401, East Tower, 401 M St. SW., Washington, D.C. 20460. Three copies of the comments should be submitted to facilitate the work of the Agency and others interested in inspecting them. The comments must be received on or before July 8, 1977 and should bear a notation indicating the EPA File Symbol "6922-RI." Comments received within the specified time period will be considered before a final decision is made with respect to the pending application. Comments received after the specified time period will be considered only to the extent possible without delaying processing of the application. Specific questions concerning this application should be directed to the Product Manager (PM) 31, Registration Division (WH-567), Office of Pesticide Programs, at the above address or by telephone at 202-426-2635.

Notice of approval or denial of this application to register ARQUAD DMCB will be announced in the FEDERAL REGISTER. The label furnished by Armak Co.,

as well as all written comments filed pursuant to this notice, will be available for public inspection in the office of the Federal Register section from 8:30 a.m. to 4:00 p.m. Monday through Friday.

Dated: June 1, 1977.

DOUGLAS D. CAMPT,
Acting Director,
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PESTICIDE PROGRAMS

Renewal of a Temporary Tolerance 2-chloro-N-(2-ethyl-6-methylphenyl)-N-(2-methoxy-1-methylethylacetamide)

On May 6, 1976, the Environmental Protection Agency (EPA) announced (41 FR 18709) a renewal of temporary tolerances for combined residues of the herbicide 2-chloro-N-(2-ethyl-6-methylphenyl)-N-(2-methoxy-1-methylethylacetamide and its metabolites converted to 2-((2-ethyl-6-methylphenyl)amino)propanol (calculated as the herbicide) in or on several raw agricultural commodities as follows:

Corn fodder and forage at 0.75 part per million (ppm);

Corn grain and fresh corn, including sweet corn (kernels plus cob with husk removed) at 0.05 ppm;

Eggs, milk, and the meat, fat, and meat byproducts of cattle, goats, hogs, horses, poultry, and sheep at 0.02 ppm.

These tolerances were established (40 FR 13334) in response to a Pesticide Petition (PP5G1553) submitted by Ciba-Geigy Corp., Agricultural Div., P.O. Box 11422, Greensboro, N.C. 27409. This renewal expired April 30, 1977.

Ciba-Geigy Corp. has requested a three-month extension of these temporary tolerances both to permit continued testing to obtain additional data and to permit the marketing of the above raw agricultural commodities when treated in accordance with the provisions of an experimental use permit that has been extended under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended (86 Stat. 973; 89 Stat. 751; 7 U.S.C. 136(a) et seq.).

The scientific data reported and all other relevant material have been evaluated, and it has been determined that a renewal of the temporary tolerances will protect the public health. Therefore, the temporary tolerances are renewed on condition that the pesticide is used in accordance with the experimental use permit with the following provisions:

1. The total amount of the pesticide to be used must not exceed the quantity authorized by the experimental use permit.

2. Ciba-Geigy Corp. must immediately notify the EPA of any findings from the experimental use that have a bearing on safety. The firm must also keep records of production, distribution, and performance and on request make the records available to any authorized officer or employee of the EPA or the Food and Drug Administration.