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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460
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APR 4 1985

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: PP#4F3148/FAP#4H5443: Bayleton on Tomatoes

FROM: King Zee, Chemist
Analytical Chemistry Section

THRU: Donald A. Marlow, Chief
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THRU: Warren R. Bontoyan, Head WRB
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TO: Charles L. Trichilo, Chief
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

The Residue Chemistry Branch (RCB) requested ACS to conduct a method trial on the analysis of Bayleton and its three metabolites (KWG-0519, KWG-1323 and KWG-1342) in tomatoes. The method used for analysis was developed by the Mobay Chemical Corporation. It is titled, Residue Analysis Procedure for Bayleton and Metabolites in Barley and Wheat, and has been revised by the company a number of times for additions or clarifictions.

In November of 1984, ACS received a July 27, 1983 revised edition of the method which was tried without success. The company submitted a January 24, 1985 revision in order "to clarify description of gel permeation column (p.3) and to clarify the stated purpose for addition of Appendix IV". The revision was received by ACS on or about February 12, 1985, and other than taking three days to analyze a set of four samples, gave satisfctory recoveries.

Principle of Analysis

Bayleton and metabolites are extracted from tomatoes by a methanol-water mixture which is filtered to remove solids. The filtrate is evaporated to the aqueous phase which is incubated in a 37° C water bath for 16-18 hours with a cellulase enzyme solution. After incubation, Bayleton and the metabolites are then extracted with dichloromethane (DCM). The DCM extract is evaporated to dryness and the residue is dissolved in chloroform and subjected to a gel permeation chromatography and florisil cleanup. After the florisil column cleanup, KWG 1342 and KWG 1323 fractions are derivatized to an ester by trifluoroacetic anhydride. The ester is analyzed by GLC with a N/P detector. Bayleton and KWG 0519 can be measured directly by GC without derivatization.

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Source of Analytical Standards

Bayleton and metabolites KWG-0519, 1323, and 1342 were obtained from RTP. The derivatizing reagent trifluoroacetic anhydride is a common chemical reagent and is readily available from chemical supply houses.

Derivatization

The derivatization procedure is one that is comonly used in pesticide residue analysis. In brief, it consists of adding trifluoroacetic anhydride (TFA) to the isolated KWG 1342 and 1323 residues, heating the reaction mixture, and removing the excess TFA. The residue left after removal of TFA is dissolved in acetone for GLC analysis.

Gas Chromatography Conditions

Column 3' x 1/8" I.D. glass packed column with
10% DC 200 and 1.5% QF - 1 on 80/100 chromosorb W

Carrier Gas: He - 60 ml/min

Oven Temp : 195° C

Injection Port Temp: 225° C

Detector Temp: 250° C

Note R_t for:

Bayleton - 3.96 min
KWG 0519 - 5.23 min
KWG 1323 derivative - 6.11 min
KWG 1342 derivative - 4.65 min

RECOVERIES

Chemical added	PPM	ppm found	recovery
Bayleton	0.00	<0.01	
	0.00	<0.01	
	0.05	0.04	80
	0.05	0.04	80
	0.20	0.16	80
	0.20	0.20	100
KWG0519	0.0	<0.01	
	0.0	<0.01	
	0.05	0.04	80
	0.05	0.04	80
	0.20	0.15	75
	0.20	0.16	80
KWG1323	0.0	<0.01	
	0.0	<0.01	
	0.05	0.04	80
	0.05	0.04	80
	0.20	0.16	80
	0.20	0.16	80
KWG1342	0.0	<0.01	
	0.0	<0.01	
	0.05	0.04	80
	0.05	0.04	80
	0.20	0.19	95
	0.20	0.19	95

Comments:

(1) Method is long; it takes three days to analyze a set of 4 samples.

(2) Method gives satisfactory results.

(3) Method appears to have no safety problems.