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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 11 1988

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: EPA Reg. No. 4787-4. Methyl Parathion Product
Chemistry in Response to the Methyl parathion
Registration Standard Data Gaps. MRID No.
404066-01. RCB No. 3107.

FROM: Sami Malak, Ph.D., Chemist *Sami Malak*
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Residue Chemistry Branch
Hazard Evaluation Division (TS-769C)

TO: Amy S. Rispin, Chief
Science Integration Staff
Hazard Evaluation Division (TS-769C)

and

Dennis Edwards, PM #12
Insecticide-Rodenticide Branch
Registration Division (TS-767)

THRU: Philip Errico, Section Head *Philip Errico*
Residue Chemistry Branch
Hazard Evaluation Division (TS-769C)

In response to the Methyl Parathion Registration Standard of December, 1986, Jellinek, Schwartz, Connolly and Freshman, Inc. on behalf of A/S Cheminova of Lemvig, Denmark; responded on November 9, 1987 by submitting product chemistry data cited in the Standard as data gaps for their technical methyl parathion, EPA Reg. No. 4787-4.

Methyl parathion is the common name for the insecticide O,O-dimethyl-O-4-nitrophenyl phosphorothioate. Technical methyl parathion is manufactured by A/S Cheminova of Lemvig, Denmark. Cheminova apparently formulate several intermediate products as manufacturing-use products (MUP). Cheminova also sells technical methyl parathion to several other companies for

formulating intermediate products (MUP's), or end-use products (EUP's), several of which are registered with the EPA.

Technical methyl parathion contains 77% active ingredient, 3% related compounds, 18% xylene, and 2% inert ingredients.

Detailed data gaps cited in Table A of the Standard for technical methyl parathion comprise data required under Guideline Sections 61 and 63 of the Product Chemistry Guidelines, Subdivision D.

In our discussion below, we list the data gaps, followed by the applicant's response and RCB's Comments:

Series 61: Product Identity and Composition

§61-2 Description of Beginning Materials and Manufacturing Process

Applicant's Response:

Beginning Materials- The information the applicant has submitted in response to this requirement are included in the confidential appendix of this review (Attachment-2, 2 pages, CBI).

RCB's Comments:

The applicant complied with data requirements under §61-2 of the Product Chemistry Guidelines, Subdivision D. RCB concludes no additional information is required to satisfy data requirements of 40CFR§158.120.

Series 63: Physical and Chemical Properties

The physical and chemical properties test requirements for the technical grade of methyl parathion are detailed in the Pesticide Assessment Guidelines, Subdivision D, Product Chemistry, §63-2 thru §63-13 (40CFR§158.120)..

Registrant's Response

The physical and chemical characteristics for technical methyl parathion required under this series, were reported by the applicant as follows:

- §63-2 color Amber
- §63-3 Physical State Solid crystalline
- §63-4 Odor Sweet, garlic like odor
- §63-5 Melting Point 35-36°C

S63-5 Melting Point

35-36°C

S63-6 Boiling Point

109°C at 0.05 mm Hg

S63-7 Bulk Density

1.358

S63-8 Solubility

For pure active ingredien

<u>Solvent</u>	<u>% w/w</u>
Acetonitrile	80.2
Toluene	78.2
xylene	75.3
Tenneco	72.3

S63-10 Dissociation

The molecular structure of methyl parathion does not indicate any significant dissociation in aqueous solution. Not applicable.

S63-12 pH

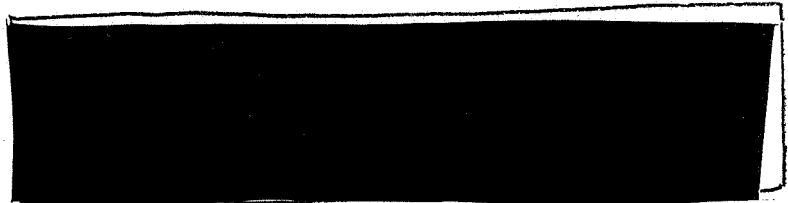
4.1 (was incorrectly reported under S63-11).

S63-13 Stability

A study included in this submission conducted by McPherson and Johnson (Thermal Decomposition of Some Phosphorothioate Insecticides; J. Agric. and Food Chem. Vol. 4:42-49, 1956), indicated that decomposition of methyl parathion homolog occurs in two steps. The first generates dimethyl sulfide, sulfur dioxide, and a mixture containing poly aryl metaphosphate. This mixture decomposes, sometimes explosively, to a carbonaceous residue in the second step. Estimated time for decomposition to occur are:

<u>Temp. °C</u>	<u>Decomposition Time</u>
115	7.9 hours
100	26.0 hours
80	5.6 days
65	23 days

MANUFACTURING PROCESS INFORMATION IS NOT INCLUDED



We consider that methyl parathion is stable at 25°C. No evidence of major instability below 115°C.

RCB's Comments:

RCB concludes the following additional information is required to satisfy the data requirements of 40CFR§158.120 (Guidelines Ref. Nos. §63-2 thru §63-13), on the physical and chemical characteristics of technical grade of methyl parathion:

§63.13 Stability- Information on "consideration and discussion of the sensitivity of the active ingredient to metal ions and metal" and the "sensitivity of the active ingredient to sunlight" (see §63-13 reporting Requirements, Product Chemistry Guidelines).

Conclusions and Recommendations:

1. We recommend that data available for methyl parathion technical in this review, be included in the Methyl Parathion Registration Standard.
2. An update copy of Product Chemistry Table A is attached.
3. Data gaps remaining for technical methyl parathion are:
(a) Preliminary Analysis of Product samples (§62-1); and
(b) Stability (§63-13).

Attachments:

1. Table A, update (2 pages).
2. Beginning materials (2 pages, CBI).

cc With Attachments: RF, SF (methyl parathion), Methyl Parathion RS File, TOX, D. Edwards (PM #12, RD), S. Malak, and PMSD/ISB.

RDI: P.V.Errico:2/11/88.R.D.Schmitt:2/11/88

TS-769C:RCB:CM#2:RM814A:S.Malak:X557-4379:s.m.:2/11/88

DATA REQUIREMENTS FOR METHYL PARATHION UNREGISTERED TECHNICAL a

Table A

Data Requirement	Composition ^b	Does EPA Have Data to Satisfy This Requirement?	Bibliographic Citation	Must Additional Data be Submitted under FIFRA Section
<u>158.120 Product Chemistry</u>				
<u>Product Identity and Composition:</u>				
61-1 - Product Identity and Disclosure of Ingredients	TGAI	Yes	-----d	No
61-2 - Description of Beginning Materials and Manufacturing Process	IGAI	Yes	00055866, 00055859	No
61-3 - Discussion of Formation of Impurities	TGAI	Yes	00055859	No
<u>Analysis and Certification of Product Ingredients</u>				
62-1 - Preliminary Analysis of Product Samples	TGAI	No	00055859	Yes
<u>Physical and Chemical Characteristics, f</u>				
63-2 - Color	TGAI	Yes	00404066 001	No
63-3 - Physical State	TGAI	Yes	00404066	No
63-4 - Odor	TGAI	Yes	00404066	No
63-5 - Melting Point	TGAI	Yes	00404066	No
63-6 - Boiling Point	TGAI	Yes	00404066	No
63-7 - Density, Bulk Density or Specific Gravity	TGAI	Yes	00404066	No

- a The unregistered technical is used to produce A/S Chemnova's 80% formulation intermediate (EPA Reg. No. 4787-4).
- b Composition: IGAI = technical grade of the active ingredient.
- c Data must be submitted no later than 6-8 months from the date of this standard.
- d Information obtained from desk references.

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DATA REQUIREMENTS FOR METHYL PARATHION UNREGISTERED TECHNICAL a

Table A (Continued)

Data Requirement	Composition ^b	Does EPA Have Data to Satisfy This Requirement?	Bibliographic Citation	Must Additional Data be Submitted under FIFRA Section 3(c)(2)(b)? ^c
<u>158.120 Product Chemistry (continued)</u>				
63-8 - Solubility	TGAI or PAI	Yes	00404066 81	NO
63-9 - Vapor Pressure	TGAI or PAI	Yes	00055860	NO
63-10 - Dissociation Constant	TGAI or PAI	Yes	00404066 01	NO
63-11 - Octanol/Water Partition Coefficient	PAI	Yes	00055860	NO
63-12 - pH	TGAI	Yes	00404066 01	NO
63-13 - Stability	TGAI	Partially	00404066 01	Yes
Other Requirement				
64-1 - Submittal of Samples	N/A	N/A		NO

- a The unregistered technical is used to produce A/S Cheminova's 80% formulation intermediate (EPA Reg. No. 4787-4).
- b Composition: TGAI = technical grade of the active ingredient.
- c Data must be submitted no later than 6-8 months from the date of this standard.
- d Data needed in accordance with the Pesticide Assessment Guidelines, Subdivision O.

Page 7 is not included in this copy.

Pages _____ through _____ are not included in this copy.

The material not included contains the following type of information:

Identity of product inert ingredients.

_____ Identity of product inert impurities.

Description of the product manufacturing process.

_____ Description of quality control procedures.

_____ Identity of the source of product ingredients.

_____ Sales or other commercial/financial information.

_____ A draft product label.

_____ The product confidential statement of formula.

_____ Information about a pending registration action.

_____ FIFRA registration data.

_____ The document is a duplicate of page(s)

_____ The document is not responsive to the request.

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.
