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

JAN 29 1996

OFFICE OF
PREVENTION, PESTICIDES, AND
TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Mepiquat Chloride. Magnitude of Residue in Milk, Meat, Poultry and Eggs. Case No. 2375. Chemical No. 109101. MRID Nos. 437386-01, 437386-02, 437386-03. CBRS No. 16080. DP Barcode D218492.

FROM: Felecia A. Fort, Chemist
Chemistry Pilot Review Team
Chemistry Branch II: Reregistration Support
Health Effects Division (7509C)

THRU: Edward Zager, Branch Chief
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TO: Patrick Dobak/Kathleen Depukat PM-51
Accelerated Reregistration Branch
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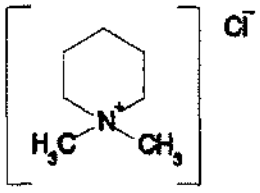
BASF Corporation has submitted magnitude of the residue in milk, meat, poultry and eggs studies to fulfill requirements for the reregistration of mepiquat chloride. Mepiquat is currently registered for use on cotton only.

Tolerances are established for cotton forage (3.0 ppm) and cottonseed (2.0 ppm), livestock meat, fat, and meat byproducts (0.1 ppm), milk (0.05 ppm), and eggs (0.05 pp) (40 CFR §180.384). A 3.0 ppm feed additive tolerance is established on cottonseed meal (40 CFR §186.2275).

The structure of mepiquat chloride is shown below.



CONCLUSIONS

1. Product Chemistry requirements have been fulfilled for mepiquat chloride. No additional data are needed.

2a. The nature of the residue in plants is adequately understood. The residue of concern is the parent, mepiquat chloride.

2b. The nature of the residue in animals is adequately understood. The residue of concern is the parent, mepiquat chloride.

3a. BASF Method A9104 was used for analysis and has been found to be adequate for data collection.

3b. An enforcement method exists in PAM Vol. II as Method I and is considered adequate for plant and animal tolerance enforcement purposes.

4. Mepiquat chloride is stable in ruminant and poultry tissue and eggs when stored frozen (<-20°C) for at least 26 months and in milk for at least 38 months under similar conditions. Storage stability data adequately support the integrity of samples analyzed in this study.

5a. No detectable residues (<0.05 ppm) were found in ruminant fat or muscle and only a small amount (0.053 ppm) was found in milk at the lowest dosage rate of 13 ppm (7X). Residues ranging from 0.100 - 0.204 ppm and 0.09 - 0.194 ppm were found in kidney and liver, respectively, at this rate.

5b. No residues were found in poultry tissue or eggs at a rates of 1.0 ppm (2.5X) or 5.0 ppm (12.5X). Residues ranged from <0.05 ppm-0.10 ppm in eggs at the 15.0 ppm (37.5X) rate. No residues were found in poultry tissue samples at any dosage rate.

RECOMMENDATIONS

No additional data are needed to satisfy requirements of Guideline 171-4(j). The data indicate that tolerances for ruminant tissue are sufficient. No changes to the tolerances are needed. With regard to milk, poultry and eggs, a 40 CFR 180.6(a)(3) [Category 3] situation exists. Milk, poultry and egg tolerances should be revoked since data indicate that no residues are likely in these commodities. A tolerance reassessment will

be performed in the Chemistry RED chapter.

DETAILED CONSIDERATIONS

NATURE OF THE RESIDUE

The nature of the residue in plants and animals is adequately understood. The residue of concern is the parent, mepiquat chloride *per se*.

ANALYTICAL METHODOLOGY

Analytical method A9104 was used for analysis. It has been found to be adequate for data collection and has been validated by an independent laboratory. The limit of quantitation is reported as 0.05 ppm. Samples were analyzed using ion chromatography (ion pairing mode) and conductivity detection. Recovery data are shown in Table 1.

Method I in PAM, Vol. II, is described as very specialized and as having recoveries in the 50% range, but is considered adequate for plant and animal tolerance enforcement purposes.

Table 1. Method Validation Data

Matrix	Fortification Level (ppm)	Percent Recovery (%)
Lactating Cow		
Milk	0.05 0.10 0.20 0.50	81 77 89 78
Kidney	0.05 1.0 2.5	91 87 94
Liver	0.05 1.0 1.5	112 89 81

Matrix	Fortification Level (ppm)	Percent Recovery (%)
Fat	0.05 1.0	92 87
Muscle	0.05 1.0	91 95
Laying Hen		
Eggs	0.05 0.10 0.50	84 88 87
Liver	0.05 1.0	90 83
Muscle	0.05 1.0	84 95
Fat	0.05 1.0	76 91
Skin	0.05 0.50	86 78

1. BASF Method A9104.

STORAGE STABILITY

A storage stability study was submitted with this package. Samples of control tissue and eggs purchased from a local grocery store and milk purchased from a local dairy were fortified at 1.0 ppm with mepiquat chloride. Samples were analyzed at 0, 6, 13, 26, and 38 months (milk only). Samples were analyzed using BASF Method A9104. This method has been deemed adequate for data collection. Mepiquat chloride is stable in animal tissue and eggs for at least 26-27 months and in milk for at least 38 months when stored frozen. Results are shown in Table 2.

Egg and hen tissue used for magnitude of the residue trials were stored for 7 and 18 months, respectively. Milk and ruminant tissue were stored for 32 and 21 months, respectively.

Available storage stability data are adequate to support the integrity of the samples analyzed in this study.

Table 2. Storage Stability of Mepiquat Chloride in Animal Tissue

Matrix	Storage Interval (months)	Stored Recovery (%)[1]	Procedural Recovery (%)[1,2]
Cow Liver	0	85%	85%
	6	73	72
	13	70	80
	27	95	95
Cow Kidney	0	90	90
	13	84	76
	26	91	90
Cow Muscle	0	78	78
	6	73	70
	13	80	80
	26	98	96
Cow Fat	0	101	101
	14	81	83
	26	99	98
Chicken Muscle	0	87	87
	13	83	78
	26	88	84
Milk	0	84	84
	7	86	89
	14	84	85
	26	77	76
	38	79	78
Egg	0	91	91
	6	84	83
	13	77	73
	26	89	80

1. All values are the average of duplicate analyses except for the 0 month interval which is the average of quadruplicate analyses.
2. Procedural recovery represents samples fortified on day of analysis.

Magnitude of the Residue in Meat, Milk, Poultry, and Eggs

Lactating Cow

Three groups of three dairy cows were orally dosed once daily with mepiquat chloride at 13 ppm (6.5x), 65 ppm (34x) and 195 ppm (102x) for 28 days. The cows were sacrificed within 24 hours after the last dose. Milk samples were collected twice daily. Samples were analyzed using method A9104 as described above.

No residues were detected (<0.05 ppm) in milk at the 7x dose level (13 ppm) with the exception of one sample on day 24 which was found to be 0.053 ppm. Residues were found in three samples

at the 34x dose level (65 ppm) on day 10, day 24, and day 28 at 0.05 ppm, 0.05 ppm and 0.06 ppm, respectively. At the 102x rate, residues increased through day 4 and appeared to plateau at day 7 with variations up and down through day 28. The highest residue was 0.147 on day 28.

No residues of mepiquat chloride were found in fat and muscle tissue at the 7x rate and were 0.100-0.204 ppm and 0.09-0.194 ppm in kidney and liver, respectively. Results are shown in Table 3 below.

Table 3. Magnitude of the Residue in Lactating Cow

Matrix	Total Residues (ppm)[1]		
	13 ppm (7X)	65 ppm (34X)	195 ppm (103X)
Milk	<0.05-0.053 ppm[2]	<0.05-0.06 ppm	<0.05-0.147 ppm
Kidney	0.204 0.100 0.135	0.623 1.16 1.01	2.39 1.78 2.42
Liver	0.143 0.090 0.194	0.578 0.734 0.588	1.58 0.982 1.39
Fat	<0.05 <0.05 <0.05	<0.05 <0.05 0.053	0.052 0.06 0.364
Muscle	<0.05 <0.05 <0.05	0.083 0.090 0.120	0.299 0.175 0.240

1. Residues in controls were <0.05 ppm.
2. One sample(0.053 ppm) was above the limit of detection.

Laying Hen

Three groups of 15 hens each were dosed with mepiquat chloride at a dosage level of 1.0 ppm (2.5X) 5.0 ppm (12.5X) and 15.0 ppm (37.5X) for 28 days. Egg samples were collected twice each day. All hens were sacrificed within 24 hours of the last dose. Samples were analyzed using Method A9104 as described above.

Residues were not detected in egg samples at the 1.0 ppm and 5.0 ppm dosage levels. Residues in egg samples at the 15.0 ppm rate

ranged from <0.05 ppm - 0.10 ppm. Residues in egg were not detected until day-7 and appeared to plateau at this rate after 14 days. No residue were found in tissue samples at any dosage rate. Results are shown in Table 4 below.

Table 4. Magnitude of the Residues in Laying Hens

Matrix	Total Residues (ppm)[1]		
	1.0 ppm (2.5x)	5.0 ppm (12.5x)	15.0 ppm (37.5x)
Eggs (0-28 days)	<0.05 ppm	<0.05 ppm	<0.05-0.10 ppm
Liver	<0.05	<0.05	<0.05
Muscle	<0.05	<0.05	<0.05
Fat	<0.05	<0.05	<0.05
Skin	<0.05	<0.05	<0.05

1. Results represent 15 hens.

cc: Reviewer(F. Fort), Reg. Std. File, RF, SF, Circ.
RDI:Pilot Team:1/23/96:RPerfetti:1/25/96:EZager:1/25/96
7509C:CBRS:CM#2:Rm805B:305-7478:FAFort/FF:1/23/96
Disk6:mepiquat.mme

F I F R A

CONFIDENTIAL BUSINESS INFORMATION
DOES NOT CONTAIN
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Some information in the attached material may be entitled to treatment as trade secret or proprietary data section 7(d) and section 10 the Federal Insecticide Fungicide and Rodenticide Act (FIFRA) as amended.

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

AUG 9 1995

MEMORANDUM

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

SUBJECT: **Mepiquat Chloride.** BASF's 4/26/94 Response [61-1, Series 62 data, & a **CSF** for the 58% MP] to an Agency 2/28/94 Letter, & to a K. Dockter 7/27/93 Review; CBRS 11966. MRID# 43209701, CBRS 14099, Barcode D205898, Case 2375.

FROM: K. Dockter, Chemist
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Chemistry Branch II, Reregistration Support
Health Effects Division (7509C)

THRU: Andrew R. Rathman, Section Chief
Special Review Section I
Chemistry Branch II, Reregistration Support
Health Effects Division (7509C)

TO: Kathryn Davis / Ruby Whiters, PM Team 52
Accelerated Reregistration Branch
Special Review and Reregistration Division (7508W)

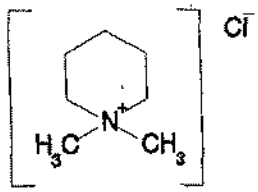
In response to an Agency letter dated 02/28/94 and the K. Dockter review [CBRS No. 11966] dated 7/27/93, BASF Corporation Agricultural Products Group has submitted additional product chemistry data in support of reregistration of mepiquat chloride. This information addresses data requirements of Guidelines 61-1, 62-1, 62-2, & 62-3. The current submission contains a Confidential Statement of Formula [CSF] dated 4/21/94 on EPA Form 8570-4 (Rev. 2-85) and a study (performed in-house, BASF Report No. FR9413 dated 4/20/94) entitled, "Mepiquat Chloride 5-Batch Analysis and Analysis Method Validations: Supplementary Report to MRID 41889002". This study addresses, "Guideline Numbers 62-1 and 62-3". MRID 41889002 was reviewed by K. Dockter; CBRS No. 8335 dated 8/06/92. The current submission is discussed below.

Conclusion:

The now available data satisfy the requirements for Guidelines 61-1, 62-1, 62-2, and 62-3 in support of reregistration of mepiquat chloride.

Detailed Considerations

The chemical structure for the bioregulator mepiquat chloride [N,N-dimethylpiperidinium chloride] is given below.



61-1 Product Identity and Disclosure of Ingredients

BASF has provided on EPA Form 8570-4 [Rev. 2/85] a revised CSF dated 4/21/94 for product MC-6. A summary of the current submission regarding mepiquat chloride product identity and composition is given in the Confidential Appendix.

62-1 Preliminary Analysis

and

62-3 Enforcement Analytical Methods

The registrant has provided a report addressing the sensitivity of the analytical method used in the preliminary analysis of the 58% MP. That preliminary analysis, reported in MRID 42690701, was reviewed in CBRS 11966. The current report shows that the method is sensitive enough to detect impurities down to a concentration of 0.046 wt % in the 58% MP. See the Confidential Appendix for specific details.

62-2 Certification of Limits

The certified limits given in the current revised CSF dated 4/21/94 agree with those derived from the preliminary analysis reported in MRID 42690701. These limits are discussed in the Confidential Appendix.

Attachment: Confidential Appendix [1 page]

cc [w/ Confidential Appendix]: K. Dockter, RF, SF, List B File.
cc [w/o Confidential Appendix]: circ

RD/I ARRathman 8/3/95; RBPerfetti 8/3/95; EZager 8/7/95
7509C:CBRS:CM#2:RM804S:3057886:KD/Kd:August 7, 1995
566C[MEPIQUAT.### + D205898.CBI]

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Pages _____ through _____ are not included in this copy.

The material not included contains the following type of information:

X Identity of product inert ingredients.

X Identity of product impurities.

X 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.