DATA EVALUATION RECORD

STUDY 3

CHEM 109101 Mepiquat chloride 163-1

FORMULATION--00--ACTIVE INGREDIENT

STUDY ID 41488113
Ellenson, J. L. 1987. Soil adsorption/desorption of mepiquat chloride. BASF Registration Document No. 87/5076. Unpublished study performed and submitted by BASF Corporation, Research Triangle Park, NC.

DIRECT REVIEW TIME = 12

REVIEWED BY: J. Harlin TITLE: Staff Scientist

EDITED BY: W. Martin TITLE: Staff Scientist
K. Patten Task Leader

APPROVED BY: W. Spangler TITLE: Project Manager

ORG: Dynamac Corporation
Rockville, MD
TEL: 468-2500

APPROVED BY: G. Maske
TITLE: Chemist
ORG: EFGWB/EFED/OPP
TEL: 557-8245

SIGNATURE:

CONCLUSIONS:

Mobility - Leaching and Adsorption/Desorption

1. This study can be used to fulfill data requirements.

2. Mepiquat chloride is mobile in loam and clay soils and very mobile in sand and sandy loam soils. Adsorption increased with increasing soil organic matter and clay content.

3. This study is acceptable and partially fulfills EPA Data Requirements for Registering Pesticides by providing information on the mobility (batch equilibrium) of unaged [^{14}C]mepiquat chloride in sand, sandy loam, loam, and clay soils.

4. No additional information on the mobility of unaged mepiquat chloride is needed at this time. Information on the mobility of aged mepiquat chloride residues is required.

METHODOLOGY:

Sand, sandy loam, loam, and clay soils (Table 1) were selected for the experiment; soil preparation prior to use was not described. Based on preliminary batch equilibrium experiments, an equilibration period of 24 hours was selected for the definitive study.

Ring-labeled [^{14}C]mepiquat chloride (labeled in the 2,6 positions; radiochemical purity ≥96.5%, specific activity 0.111 mCi/mg, BASF) plus unlabeled mepiquat chloride (purity ≥98.5%, BASF), in water, was mixed with 0.01 M $CaCl_2$ solutions to produce final mepiquat chloride concentrations of 2.05, 1.12, 0.376, and 0.190 ug/mL. Portions (1 g) of the test soils were mixed with aliquots (5.055 mL) of the mepiquat chloride-treated solutions. The soil:solution slurries plus duplicate control samples (mepiquat chloride-free solution) were agitated on a mechanical shaker for 24 hours at 25 C in the dark. Following equilibration, the solutions were centrifuged for 20 minutes, and three 1-mL aliquots of the supernatant were removed and analyzed for total radioactivity by LSC.

The clay soil was the only test soil that adsorbed sufficient mepiquat chloride to permit a desorption study. To determine the desorption potential of mepiquat chloride, the supernatants were replaced with mepiquat chloride-free 0.01 M calcium chloride solution. The soil:solution slurries were shaken for an additional 24 hours at 25 C and centrifuged; the desorption was repeated once. Following the second desorption step, the supernatants from the two desorptions were combined. Aliquots of the combined supernatants were analyzed for total radioactivity using LSC.

DATA SUMMARY:

Based on batch equilibrium experiments, ring-labeled [^{14}C]mepiquat chloride (labeled in the 2,6 positions; radiochemical purity ≥96.5%), at 2.05, 1.12, 0.376, and 0.190 ug/mL, was determined to be very mobile to mobile in sand, sandy loam, loam, and clay soil:$CaCl_2$ solution slurries that were equilibrated for 24 hours at 25 C. The average Freundlich K_{ads} values were 0.220 for the sand, 9.88 for the sandy loam, 12.0 for the loam, and 25.0 for the clay soils; respective K_{oc} values were 195, 2000, 2000, and 2250 (Table III). Adsorption increased with an increase in soil organic matter content and clay content. Following desorption, an average Freundlich K_{des} value of 0.22 was calculated for the clay soil; desorption could not be determined with the sand, sandy loam, and loam soils because of insufficient adsorption (Table III). Material balances ranged from 93.1 to 100.0% (Table IV).

COMMENTS:

1. Details of the experimental design were omitted; for example, a description of the soil preparation prior to the initiation of the study was not included.

2. The three highest mepiquat concentrations were obtained by fortifying labeled mepiquat with the unlabeled standard. The lowest concentration was obtained using the labeled standard alone.

3. Based on soil, the concentration of mepiquat chloride in the soil:solution slurries was 10.4, 5.66, 1.90, and 0.96 ug/g.

4. The study author stated that radio TLC analyses of the supernatants following adsorption showed no evidence of degradation of mepiquat chloride during the equilibration. A description of the TLC methodology and the accompanying data to support this conclusion were not provided in the original document.

5. The study author stated that the highest proposed label use rate for mepiquat chloride is for grapes at 1.0 lb ai/A. Therefore, the highest concentration of mepiquat chloride used in this study (10.4 ug/g soil) exceeds the maximum use rate by a factor of 10.

0186-06

Mepiquat Chloride MRID 41488113

Page _____ is not included in this copy.

Pages 4 through 11 are not included in this copy.

The material not included contains the following type of information:

_____ Identity of product inert ingredients.

_____ Identity of product 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.
