DATA EVALUATION RECORD

STUDY 1

CHEM 109101 Mepiquat chloride 161-1

FORMULATION--00--ACTIVE INGREDIENT

STUDY ID 41488111
Funk, H. 1989. Hydrolysis of mepiquat chloride in pH 3, 5, 7, and 9 aqueous solutions at 25 degrees C. Registration Document No. BASF 89/0313, BASF Report No. 2693. Unpublished study performed by BASF Aktiengesellschaft, Limburgerhof, West Germany, and submitted by BASF Corporation, Parsippany, NJ.

DIRECT REVIEW TIME = 8

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CONCLUSIONS:

Degradation - Hydrolysis

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

2. Mepiquat chloride did not hydrolyze in sterile aqueous buffer solutions (pH 3, 5, 7, and 9) that were incubated in the dark at 25 C for 30 days.

3. This study is acceptable and fulfills EPA Data Requirements for Registering Pesticides by providing information on the hydrolysis of ring-labeled [^{14}C]mepiquat chloride in sterile aqueous buffers at pH 3, 5, 7, and 9.

4. No additional information on the hydrolysis of mepiquat chloride is needed at this time.

METHODOLOGY:

Ring-labeled [^{14}C]]mepiquat chloride (labeled in the 2,6 positions; radiochemical purity >98%, specific activity 1.804 uCi/mMol, BASF) in water was added at 10 ppm to sterile aqueous 0.01 M buffered solutions adjusted to pH 3 (potassium hydrogen phthalate), 5 (potassium hydrogen phthalate), 7 (tris(hydroxymethyl)aminomethane), and 9 (boric acid). Glass flasks containing 200 mL of the buffered solutions were sealed with glass stoppers and incubated in the dark at 25 ± 1 C. Duplicate flasks were removed for analysis at 0, 2, 5, 9, 16, and 30 days posttreatment. The pH of the solutions was determined at each sampling interval.

Aliquots of the test solutions were analyzed by LSC for total radioactivity. The pH 3 and pH 5 buffered solutions were adjusted to pH 8 (method not reported), then all buffered solutions were partitioned three times with 2,2',4,4',4,4'-hexanitrodiphenylamine dissolved in methylene chloride (DCM). The extracts from each sample were combined, and aliquots of the DCM extracts and the extracted aqueous buffered solutions were analyzed by LSC. The DCM fractions were evaporated to dryness (at 40 C) and redissolved in acetone, and aliquots were analyzed by one-dimensional TLC on silica gel plates developed with methanol:acetone:concentrated HCl (90:10:4, v:v:v). Nonlabeled reference standards of mepiquat chloride, 1-methylpiperidine, and piperidine were cochromatographed with the samples. Radioactive areas were located by autoradiography; reference standards were located by coloring with "Dragendorff" reagent. The DCM extracts were also analyzed by HPLC using a Zorbax SCX (ion-substitution) column eluted with 0.2% triethyammoniumphosphate in distilled water with radioactivity detection.

DATA SUMMARY:

Ring-labeled [^{14}C]]mepiquat chloride (labeled in the 2,6 positions; radiochemical purity >98%) was stable in sterile buffered aqueous solutions (pH 3, 5, 7, and 9) that were incubated in the dark at 25 ± 1 C for 30 days. Mepiquat chloride was the only compound detected in solution using HPLC (Tables V-VIII). During the study, total recovered radioactivity ranged from 9.73 to 10.08 mg/kg (Tables I-IV).

The pH of the solutions remained stable during the study.

COMMENTS:

1. The "% initial radioactivity" unit used by the study author refers to the concentration of total radioactivity in the sample after incubation and prior to extraction. It is not equivalent to "% of applied radioactivity".

2. No tabular data were submitted confirming the stability of mepiquat chloride in water. The study author provided only the HPLC and TLC chromatograms.

3. The Dragendorff reagent was composed of solutions of bismuth(III) nitrate (basic) in aqueous acetic acid plus potassium iodide in water.

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