UPDATED

DATA EVALUATION RECORD

DER 1

SHAUGHNESSY No. 041402
COMMON NAME: Molinate
CHEMICAL NAME: S-Ethyl hexahydro-1H-azepine-1-carbothioate
FORMULATION: Not formulated, 99.5% pure active ingredient.
DATA REQUIREMENT: Photodegradation in Water (161-2)

MRID No: 41599301
Eya, B.K. 1989. Molinate - Aqueous photolysis at 25°C. Report No. RR 89-040B. Unpublished study performed and submitted by ICI Americas, Inc., Richmond, CA.

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CONCLUSIONS:

1. This study is scientifically valid.

2. Molinate did not photodegrade in sterile aqueous buffered (pH 7) solutions that were continuously irradiated for 14 days with a xenon arc lamp at 25°C.

3. This study is acceptable and fulfills EPA Data Requirements for Registering Pesticides by providing information on the photodegradation of molinate in sterile buffered pH 7 aqueous solutions.

4. No additional information on the photodegradation of molinate in water is required at this time.

METHODOLOGY:

Molinate (purity 99.5%, ICI Americas) was dissolved at 89.8 mg/L in a 0.025 M sterile aqueous pH 7 phosphate buffer solution. The treated solution was dispensed into quartz photolysis cells (1 cm x 1 cm x 10 cm; 10 mL volume), which were then heat-sealed. A portion of the cells were wrapped in aluminum foil to serve as dark controls. Both the exposed and shielded solutions were placed in a photoreactor that consisted of a stainless steel waterbath (30 cm x 15 cm x 5 cm) covered with a quartz window and maintained at 25 ± 1°C. The samples were irradiated continuously with a xenon arc lamp (Heraeus Suntest) that had an average intensity over the study of 508 watts/m^2 and was UV-filtered to eliminate wavelengths <290 nm (Figures 1-3). The emission spectra of the lamp was measured at the sample location with a spectroradiometer at the beginning and the end of the study; it was stated that 14 days of irradiation with the lamp was equal to 33.9 days of irradiation under clear summer skies in Richmond, CA (latitude 37° 56' N; Appendix Table 1). Irradiated samples were collected for analysis after 3, 6, 9, 12, and 14 days of irradiation; dark controls were collected after 3, 6, and 14 days only.

The test solutions were extracted (method not specified) with toluene containing 10 mg/L pebulate as an internal standard. The extracts were diluted 1:10 with toluene, then analyzed using GC (isothermal silicone-coated capillary column) with nitrogen/phosphorus detection. The precision of the GC method was 4.0%; the detection limit was 1 ppm. Method recoveries were 96.8-98.2%.

DATA SUMMARY:

Molinate (purity 99.5%), at 89.8 mg/L, did not photodegrade in sterile pH 7 buffered solutions that were continuously irradiated for 14 days (equal to 33.9 days of irradiation under clear skies in Richmond, CA) using a filtered xenon arc lamp at 25 ± 1°C. During the study, molinate ranged from 97.3-102% of the applied in the irradiated buffered solution and 95.2-98.7% in the dark control (Table II).

COMMENTS:

1. The absorbance spectrum of molinate in water is provided in Figure 5 and shows no absorbance at wavelengths > 290 nm. The absorbance spectrum of molinate in the pH 7 buffered solution was not provided, but would be expected to be similar.

2. The aqueous solubility of molinate was reported to be 970 mg/L at 25°C.