

CASE GS -- SYSTHANE STUDY 3 PM --

CHEM 128857 Systhane

BRANCH EAB DISC --

FORMULATION 00 - ACTIVE INGREDIENT

FICHE/MASTER ID No MRID CONTENT CAT 01
Ackermann, I.B. 1986c. Laboratory leaching study of 1,2,4-triazole aged residues through soil columns. Report No. 31H-86-14. Prepared and submitted by Rohm and Haas Company, Philadelphia, PA. Acc. No. 265748.

SUBST. CLASS = S.

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CONCLUSIONS:Mobility - Leaching and Adsorption/Desorption

1. This study is scientifically valid.
2. Aged (~30 days) residues of [^{14}C]1,2,4-triazole (radiochemical purity 91%) were mobile in columns of sandy loam and silty clay loam soil (~40-44% of the applied was recovered in the leachate).
3. This study does not fulfill EPA Data Requirements for Registering Pesticides because [^{14}C]residues in the soil were not characterized either before or after leaching, the length of time it took to leach the soil columns was not reported, degradates in the leachates were not sufficiently identified, degradate characterization results (TLC data) were presented as percent of recovered rather than percent of applied, and K_d values were not reported.

MATERIALS AND METHODS:

Samples of sieved (2 mm) sandy loam (68.8% sand, 20.0% silt, 11.2% clay, 2.3% organic matter, pH 4.8, CEC 8.4 meq/100 g) and silty clay loam

(8.8% sand, 62.0% silt, 29.2% clay, 1.0% organic matter, pH 5.8, CEC 8.1 meq/100 g) soils having moisture contents of ~17-18% were treated with [¹⁴C]1,2,4-triazole (radiochemical purity 91%, specific activity 318.8 mCi/g, Rohm and Haas Co.) and aged aerobically in the presence of CO₂-free air in biometer flasks at 22°C for 31-32 days. Following the aging period, an aliquot of the treated soil was placed on top of a 28 cm x 7.5 cm (i.d.) column of untreated soil which had been previously saturated with water. The final height of the soil columns was ~30 cm. The sandy loam soil columns were leached with 20.5 inches of water at a rate of 0.5 inches per day (excluding weekends). The silty clay loam soil columns were leached with 20.5 inches of water at a rate of 0.5 inches per day for the first 3 days; then, because water began to accumulate on top of the columns, 0.5 inches of water was added every other day (again, no water was added on the weekends). The leachate was collected daily and stored at 4°C until analysis (100 days after the final collection).

Radioactivity in the leachate samples was quantified by LSC. Leachate samples were concentrated by evaporation, diluted with methanol, filtered, and the filtrate was evaporated to dryness under nitrogen. The remaining residue was dissolved in methanol and analyzed by TLC on silica gel plates developed in either methyl ethyl ketone:methanol:water:acetic acid (25:50:25:1), methyl ethyl ketone:methanol:water (25:50:25), or chloroform:methanol:concentrated ammonia (25:65:10), or on reverse phase (RP-18) plates developed in methanol:water (50:50). Radiolabeled reference compounds were combined with the samples prior to TLC. Following development, radioactive areas were located by autoradiography. Only one leachate sample (day-18 from sandy loam soil column) was quantitated with a TLC scanner following development.

Following leaching, the soil columns were dissected into segments (Table 1). The soil segments were air-dried for 1-14 days, blended, and stored frozen (-12°C) until analysis (50 days). The soil was then thawed and radioactivity was quantitated by combustion and LSC.

REPORTED RESULTS:

Aged (~30 days) 1,2,4-triazole residues were mobile in sandy loam and silty clay loam soils (~40-44% of the applied was recovered in the leachate) with radioactivity distributed throughout the soil columns (Table 1). The degradate characterization data (TLC data) could not be accurately interpreted.

DISCUSSION:

1. Aged residues were not characterized prior to leaching.
2. The soil was not analyzed for 1,2,4-triazole or its degradates after leaching.
3. The total length of time it took to leach the soil columns with 20.5 inches of water was not specified.

4. Degradate characterization data were quantified for only one of the leachate samples (18-day sandy loam leachate), and these data were presented as percent of recovered rather than percent of applied. Recovery of radioactivity applied to the TLC plate was not reported (to demonstrate that recovery was quantitative). In addition, the registrant stated that only one degradate was detected, although the TLC scanner detected two following TLC separation of the sample. Also, only two reference compounds (RH-4098 and RH-3968, structures not provided) were cochromatographed with the sample and a reference standard of the parent (1,2,4-triazole) was not chromatographed in the same solvent systems used to separate the sample; therefore, the registrant has not demonstrated that the degradates detected in the samples were accurately characterized.
5. Soil/water relationship (K_d) values were not reported.
6. The Lawrenceville silt loam soil was misclassified in the study. The soil was determined to be a silty clay loam soil according to the USDA Textural Classification System and is described as such in this report.