DATA EVALUATION RECORD

3/14/1991

STUDY IDENTIFICATION:

Parson W.M. and J.D. Fisher. February 14, 1978. Metabolism of RH-2915 in Aerated and Non-Aerated Flooded Soil. Rohm and Haas Company, Philadelphia, Pennsylvania. MRID# 149203.

REVIEWED BY:

Elizabeth A. Resek, Chemist
Environmental Chemistry, Review Section 1
OPP/EFED/EFGWB

Signature: Elizabeth A. Resek
Date: MAR 14 1991

APPROVED BY:

Paul Mastradone Ph.D., Chief
Environmental Chemistry, Review Section 1
OPP/EFED/EFGWB

Signature: Paul J. Mastradone
Date: MAR 14 1991

TYPE OF STUDY: Aerobic and Anaerobic Aquatic Metabolism

CONCLUSIONS:

EFGWB concludes that the study submitted does not satisfy data requirements for anaerobic aquatic metabolism. The study cannot be made acceptable upon submission of additional information, therefore, a new study is required. The decline of parent and the formation and decline of degradates were not established. Also, anaerobicity was not established. No half-life could be determined from the results of the study.

MATERIALS AND METHODS:

^{14}C-oxyfluorfen labeled in the trifluoromethyl group (specific activity 3.84 mCi/g) and in the nitrophenyl ring (specific activity 2.61 mCi/g) was used in the study. Prior to application, the Loessail Plains clay loam test soil (see Table I for soil characteristics) was sieved through a 2.00 mm sieve and 100 g added to each of 14 500-ml glass containers. Three hundred milliliters of tap water was added to each container and allowed to equilibrate for one week. Ten containers were then aerated while four were left unaerated. ^{14}C-oxyfluorfen was applied at the rate of 1 lb a.i./A to each container.

Sampling occurred at Day 0, and at Weeks 1, 3, 6 and 12 for the aerated samples, and at Weeks 3 and 12 for the non-aerated samples.

Water was decanted into centrifuge bottles twice, then radioassayed by liquid scintillation counting (LSC). The solids remaining were resuspended in water and analyzed by LSC also. The containers with the remaining test soil were placed in a freezer until soil became solid. Soil was transferred to dry ice, thawed and allowed to air dry. Soil was then combusted and the $^{14}CO_2$ trapped before being measured by LSC. Residues from container walls were rinsed with methanol and analyzed by LSC. The centrifuged water, suspended solids, soil and methanol rinses of the test vessels were also extracted and radioassayed. Concentrated extracts were analyzed by thin-layer chromatography (TLC) using the following systems: Hexane:Benzene (25:75, v/v) and Acetone:Benzene (10:90, v/v). Quantitation of the TLC plates was done by LSC.

Combustion efficiencies were determined by spiking samples of control soil.

REPORTED RESULTS:

Results for the trifluoromethyl-labeled compound showed ^{14}C recovery in soil for the aerated samples ranging from 45.2% of the applied at Day 0 to 48.4% at Week 12. Week 1 showed a maximum of 66.2% of the applied recovered. There was adsorption of the chemical to the test containers in the aerated samples ranging from 5.2% of the applied at Day 0 to 48.3% by Week 12. Non-aerated samples showed ^{14}C recovery in soil samples at 87.8% of the applied at Week 3 and 94.5% by Week 12. There was < 2% of the applied ^{14}C adsorbed to the test containers (Table III).

Results for the nitrophenyl ring-labeled compound showed ^{14}C recovery in soil for the aerated samples ranging from 61.5% of the applied at Day 0 to 60.0% by Week 12. There was a decrease in ^{14}C recovery at Weeks 3 and 6. There was adsorption of the compound to the test containers for the aerated samples with 5.8% of the applied recovered at Day 0 and then increasing to approximately 60% for Weeks 3 and 6 before giving a final value of 35.4% at Week 12. Non-aerated samples showed 90.4% and 94.6% recovery of the applied radioactivity for weeks 3 and 12, respectively. There was a maximum of 5.5% ^{14}C adsorbed to the test containers (Table IV).

The authors concluded that since oxyfluorfen has a low solubility in water, ^{14}C was in suspension rather than in solution, and was probably centrifuged out of the water. ^{14}C recovery for the spiked samples for the aerated samples ranged from 88.1% to 48.4% (for the trifluoromethyl-labeled compound). Non-aerated samples showed 92.1% and 83.3% for Weeks 3 and 12, respectively (Table IV). The aerated samples for the nitrophenyl ring-labeled compound showed a range of 98.2% to 41.7% ^{14}C recovery in the spiked samples. Non-aerated samples showed 94.9% and 97.0% for Weeks 3 and 12, respectively.

Results from TLC analysis showed that ^{14}C recovered was in the form of the parent oxyfluorfen and there were no major degradates $\geq$ 10%

of the applied (Tables VII-X).

Overall material balance was 100% for both trifluoromehtyl and nitrophenyl labeled compounds.

DISCUSSION:

EFGWB concludes that the study submitted does not satisfy data requirements for anaerobic aquatic metabolism. The study cannot be made acceptable upon submission of additional information, therefore, a new study is required. The registrant should note the following deficiencies:

1. The anaerobic aquatic metabolism study must be conducted for one year or to establish decline of parent and formation and decline of degradation products, whichever comes first. The study submitted was conducted for 12 weeks with no degradation of the parent seen in that amount of time; the study should have continued.

2. There must be a sufficient number of sampling intervals.

3. Anaerobicity should be established (e.g. measurement of Eh). Equilibration of flooded samples for one week, as was done in this study, is not sufficient.

4. A half-life should be reported.

5. A water source description (pH, hardness, conductivity), soil temperature and purity of test material should be reported.