

US EPA ARCHIVE DOCUMENT

3/14/1991

DATA EVALUATION RECORD

STUDY IDENTIFICATION:

Fisher, J.D. and W.M. Pierson. March 22, 1990. A Residue and Metabolism of ¹⁴C -RH-2915 in Bluegill Sunfish: TR No. 34-23. Rohm and Haas Company, Spring House, Pennsylvania. MRID# 00096883.

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: Bioaccumulation in Fish

CONCLUSIONS:

EFGWB concludes that the study submitted is not acceptable for bioaccumulation in fish, however, it may be made acceptable upon the submission and acceptance of additional information. The nominal concentration of test substance used in the study must be reported.

Bioconcentration factors for CF₃-labeled oxyfluorfen was 605X in muscle, was 3265X in viscera and was 2200X in whole fish. The bioconcentration factors for the NPR-labeled oxyfluorfen in muscle, viscera and whole fish were 450X, 4360X and 1075X, respectively.

After 14 days depuration, the CF₃-labeled oxyfluorfen study showed 86% elimination of ¹⁴C-residues in the muscle tissue, 83% in the viscera tissue and 82% elimination in whole fish.

The NPR-labeled oxyfluorfen study showed 94, 91 and 94% elimination of ¹⁴C-residues by Day 14 of depuration in the muscle, whole fish and viscera tissues, respectively.

MATERIALS AND METHODS:

Trifluoromethyl (CF₃)-labeled oxyfluorfen (specific activity 8,404 ± 71 dpm/ug) and nitrophenyl-ring (NPR)-labeled oxyfluorfen (specific activity 5,569 ± 61 dpm/ug) were used in the study. Bluegill sunfish (mean weight 4.4 ± 0.7g; standard length 57 ± 11mm) were exposed to ¹⁴C-oxyfluorfen at an unknown nominal concentration for 40 days followed by a 14 day depuration period. A modified, intermittent-flow, proportional diluter was used to

①

deliver well water at 1 l per cycle to each aquarium (2 test aquaria, 1 control tank) at a rate of 5 l/hour. The water source was maintained at 16 ± 1 C. The dissolved oxygen ranged from 5.5-9.1mg/l, pH ranged from 6.5-7.1 and total hardness was 35mg/l as calcium carbonate.

Fish were held for a minimum of 30 days prior to the initiation of the study. Water samples were taken on Days 1, 3, 7, 10, 14, 22, 30 and 40 of exposure. Control water was sampled on Days 1 and 40 of exposure. Fish were sampled at days 1, 3, 7, 10, 14, 22, 30 and 40 of exposure and on Days 1, 3, 7, 10 and 14 of depuration.

Water, fillet and viscera samples were combusted and the resulting $^{14}\text{CO}_2$ trapped and analyzed by liquid scintillation counting (LSC). Muscle tissue was extracted with hexane and methanol to determine relative distribution of polar, non-polar and non-extractable ^{14}C residues. After extraction the samples were combusted and analyzed by LSC.

Portions of the viscera and eviscerated bodies were characterized for degradation products by LSC and thin-layer chromatography (TLC). The TLC systems used were hexane:benzene (25:75,v/v) and acetone:benzene (10:90,v/v). Cochromatography with the use of standards was done for product identification.

REPORTED RESULTS:

Cumulative mortalities for bluegill in the control, CF_3 -labeled oxyfluorfen and NPR-labeled oxyfluorfen were 2%, 1% and 1%, respectively.

^{14}C -residues, calculated as CF_3 -labeled oxyfluorfen measured in the water during the 40 day exposure period showed a final concentration of $9.3 \pm 0.4\text{ug/l}$ at Day 40 of exposure (Table I). ^{14}C residues present in muscle showed Day 40 concentrations of 6.4 mg/kg and 5.6 mg/kg for the respective CF_3 and NPR-labeled oxyfluorfen samples at day 40. Whole fish showed CF_3 and NPR-labeled oxyfluorfen samples at Day 40 contained 18.0 mg/kg and 13.0 mg/kg, respectively (Table 1).

Bioconcentration factors for CF_3 -labeled oxyfluorfen was 605X in muscle, was 3265X in viscera and was 2200X in whole fish. The bioconcentration factors for the NPR-labeled oxyfluorfen in muscle, viscera and whole fish were 450X, 4360X and 1075X, respectively.

After 14 days depuration, the CF_3 -labeled oxyfluorfen study showed 86% elimination of ^{14}C -residues in the muscle tissue, 83% in the viscera tissue and 82% elimination in whole fish.

The NPR-labeled oxyfluorfen study showed 94, 91 and 94% elimination of ^{14}C -residues by Day 14 of depuration in the muscle, whole fish and viscera tissues, respectively.

The methanol Soxhlet extraction recoveries done in preparation for

metabolite characterization are summarized in Table II. Standards cochromatographed are characterized/identified in Table III. Results of the TLC analysis can be found in Table IV. There were no metabolites >10% of the applied radioactivity present by Day 30.