

BIOSORPTION PARTITION COEFFICIENT

TEST SUBSTANCE

Identity: Decafluoro(pentafluoroethyl)cyclohexanesulfonate, DEA salt; may be referred to as CS-2070. When dissolved in water may also be referred to or as CS-2151 or FC-90. (DEA salt of perfluoro(ethylcyclohexyl) sulfonate, $[C_2F_5-CF(CF_2CF_2)_2CF-SO_3-][H_2N(CH_2CH_2OH)_2+]$)

Remarks: The 3M production lot number was not noted. The test sample is CS-2151, a mixture of CS-2070 in water (approximately 25% test substance and 75% water). Calculations were made to adjust for the actual concentration of DEA salt of perfluoro(ethylcyclohexyl) sulfonate in the test sample. The sample purity was not characterized.

METHOD

Method: 3M Environmental Laboratory protocol for measuring biosorption to activated sludge, 1/7/81.

Type: Biosorption to volatile portion of activated sludge mixed liquor.

GLP: No

Year completed: 1981

Analytical monitoring: Total organic fluorine (TOF) concentration

Statistical methods: The method detection limit was not low enough to allow for the actual calculation of biosorption partition coefficient

Test organism source: Activated sludge from the Metro Wastewater Treatment System.

Test condition:

Dilution water: Not noted.

Test solution preparation: A solution containing 0.125 mg of CS-2070 was prepared. The solution was shaken for 1 hour at 25 °C in the presence of 2000 mg VSS/L of viable or heat killed activated sludge.

RESULTS

The results showed that most of the CS-2070 (fluorochemical solids) shaken in the presence of viable activated sludge remained in the solution. Heat-killed sludge apparently adsorbed CS-2070.

CONCLUSIONS

The fluorochemical portion of CS-2151 (CS-2070), is absorbed by heat-killed organisms. Viable organisms, on the other hand, did not absorb CS-2070. The precision of the analytical measurements are too low to calculate the biosorption coefficients, but the data indicate that CS-2070 will remain in aqueous solution during passage through a wastewater treatment system. They also suggest that CS-2070 is not likely to adsorb to microorganisms or other organics in the aquatic or soil environments.

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DATA QUALITY

Reliability: Klimisch ranking = 3. The study procedure is not routinely performed and the results were determined with an analytical procedure that is not sufficiently sensitive to the test substance. The inoculum was not properly characterized. There was no characterization of the test substance purity, and the actual concentrations of the DEA salt of perfluoro(ethylcyclohexyl) sulfonate were not measured. Extrapolation from sludge to soil organic matter is tenuous.

REFERENCES

The studies were conducted by the 3M Company, Environmental Laboratory, Lab Request number 6457S, 1981.

OTHER

Last changed: 4/01/01