INDUSTRIAL CHEMICAL PRODUCTS DIVISION
FLUORAD BRAND FLUOROCHEMICAL SURFACTANT
FC-143

TYPE SURFACTANT: Anionic fluorochemical

APPEARANCE: Light-colored powder

COMPOSITION: 100% Ammonium perfluoroalkyl carboxylates

SOLUBILITY AT 25 C: >100 g in 100 g water.

TOTAL ORGANIC CARBON: 212,000 mg/kg

BIODEGRADATION:

STANDARD METHODS Biochemical Oxygen Demand Test

Chemical Oxygen Demand		700 mg/kg
Biochemical Oxygen Demand (BOD)		
	5-Day	Nil
	20-Day	Nil
Theoretical Oxygen Demand (ThOD)*		320,000 mg/kg

*Assumes C is mineralized to CO_2, and H to H_2O, and that halogen is eliminated as hydrogen halide and N as NH_3.

Shake-Culture Study

Carbon-14 labeled FC-143 showed complete resistance to microbial modification in a 2 1/2-month shake culture study. Starting with a mixed microbial inocula, the procedure involved making "adaptive" transfers at 4-5 day intervals to media containing fresh FC-143, dilute yeast extract, basal salt media. The temperature was 25 C. Reference components (phenol and LAS) were completely degraded in parallel studies. Addition of hydrogen analogs of FC-143 to the FC-143 cultures did not facilitate the degradation of the fluorochemical.

PHOTODEGRADATION:

Irradiation of a 50 ppm aqueous solution of FC-143 for 30 days resulted in no detected photoproducts on analysis by thin-layer-chromatography/radioautography, and by gas chromatography of derivatized samples. The irradiation source produced 300 nm and longer wavelength ultraviolet light to simulate natural sunlight.

AQUATIC TOXICITY:

Fish	96-Hr LC_{50}	95% C.L.
Fathead minnow (*Pimephales promelas*)	766 mg/l	(743-787 mg/l)
Bluegill sunfish (*Lepomis macrochirus*)	569 mg/l	(500-646 mg/l)
Invertebrate	48-Hr EC_{50} (mobility)	95% C.L.
Water flea (*Daphnia magna*)	632 mg/l	(570-699 mg/l)
Green Algae	14-Day EC_{50} (cell dry weight)	14-Day EC_{50} (cell count)
Selenastrum capricornutum	73 mg/l	43 mg/l

Thirty-Day Egg Fry Study

FC-143 concentrations as high as 100 mg/l had no adverse effects upon the hatchability of eggs or upon the survival and growth of fathead minnow (Pimephales promelas) fry through 30 days of post hatch exposure.

ADSORPTION TO SOIL:

Soil Adsorption Coefficient (K)	0.38
Organic Carbon Adsorption Coefficient K_{OC}	17

These adsorption coefficients, based on studies utilizing a Brill sandy loam soil and ^{14}C labeled FC-143, indicate that FC-143 would move readily with groundwater through soil. K is the ratio of the FC-143 concentration adsorbed to soil (ug ^{14}C FC-143/g soil) to the concentration dissolved in water (mg/l) at equilibrium with the soil. K_{OC} is the adsorption coefficient corrected to reflect the organic content of the soil.

SUBLIMATION:

FC-143 can be sublimed completely and recovered unchanged (as determined by IR Spectrophotometry) at 178 C and atmospheric pressure.

DISPOSAL:

Mix with flammable material and incinerate in an industrial or commercial facility. Combustion products will include HF. Disposal alternative: Dispose of waste product in a facility permitted to accept chemical wastes. Discharge spent solutions to a wastewater treatment system. Reduce discharge rate if foaming occurs. Since regulations vary, consult applicable regulations or authorities before disposal.

U.S. EPA Hazardous Waste No.: None