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Environmental fate studies of fluorotelomer intermediates used to produce surfactants and polymers.

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ABSTRACT- Fluorotelomer intermediates, such as the Telomer B 8-2 Alcohol [$\text{CF}_3(\text{CF}_2)_7\text{CH}_2\text{CH}_2\text{OH}$], are used to manufacture surfactants and polymers, which provide unique properties in a wide variety of consumer products. Fluorotelomer intermediates were selected for study because they are thought to be among the compounds into which the surfactant and polymer products may potentially degrade. Measured water-solubility and vapor pressure of this and three other purified and well-characterized intermediates [$\text{CF}_3(\text{CF}_2)_n\text{CH}_2\text{CH}_2\text{X}$, where $n = 5$ or 7 and $\text{X} = \text{OH}$ or I] are from about 50 times to more than 600 times different from values estimated by a commonly available environmental fate model. Furthermore, these compounds have been shown to adsorb strongly onto surfaces and, as such, require rigorous method development for sampling, measurement, and recovery. The Telomer B 8-2 Alcohol is not toxic to aerobic microorganisms at concentrations of at least 10 mg L^{-1} (measured water solubility is about 140 g L^{-1}). This presentation will summarize environmental fate studies conducted by DuPont, including partitioning and hydrolysis studies. The results of metabolism studies of the Telomer 8-2 Alcohol using activated sludge as the microbial inoculum will be reported. We will also discuss the steps being taking to directly study the environmental fate of fluorotelomer-based surfactants and polymers.