Mass Balance Study of Fluorinated Organic Compounds in Environmental Water Samples

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Project Abstract

The purpose of the proposed research is to perform a mass balance study to determine what fraction of fluorinated organics in environmental water samples can be accounted for by presently known compounds. Surface and/or ground water samples from the Great Lakes area will be preconcentrated and divided into two aliquots. One aliquot will be analyzed by inductively coupled plasma mass spectrometry (ICP-MS) or by combustion ion chromatography (CIC) to determine the total fluorine content. The other aliquot will be treated by solid-phase extraction to isolate organic compounds, then analyzed by ICP-MS or CIC to determine the organic fluorine content. This aliquot will also be analyzed by high-performance liquid chromatography with tandem mass spectrometry (LC/MS/MS) to identify and quantitate the known fluorinated organics by comparison with authentic standards. This mass balance will determine what fraction of the organic fluorine arises from known and unknown sources and will facilitate the identification of unknown compounds. It will provide vital information to guide and to justify future studies of the fate and transport of fluorinated organics in the environment. We anticipate that these results will support research proposals to be submitted to the U.S. Environmental Protection Agency (STAR Program) and the Centers for Disease Control.