



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2002DC9B

Title: Speciation of Tributyltin and Triphenyltin Compounds in Clays from Sediments Using Mossbauer spectroscopy

Project Type: Research

Focus Categories: Sediments, Toxic Substances

Keywords: Tributyltin compounds; triphenyltin compounds; speciation; clays; sediments; water pollution; Mossbauer spectroscopy

Start Date: 03/01/2002

End Date: 02/28/2003

Federal Funds: \$6,459

Non-Federal Matching Funds: \$15,744

Congressional District: DC

Principal Investigator:

Dr. Leopold May

The Catholic University of America

Abstract

Organotin compounds are used as antifoulants in marine paints of which triorganotin compounds still are used on many leisure marine craft and foreign vessels contributing to the problem of water quality in the waterways of this area. There are several marinas located in the District of Columbia and its environs. There is limited information on the speciation of these toxic compounds used in paint formulations in fresh and seawater and in sediments and its components found in the waterways.

The purpose of the proposed research is to determine the fate of tributyltin and triphenyltin compounds in components of sediments. The results will provide the individuals interested in water quality with knowledge of fate of the tributyltin and triphenyltin compounds. During the grant period, the study will be continued on the speciation of these compounds in clays found in the sediments from the Anacostia and Potomac Rivers. Knowledge of the products of such reactions would aid those who are making decisions concerning the future use of triorganotin compounds as antifoulants in marine paints. For those studying the environmental impact on the life forms in the waterways, it would provide knowledge of the forms of triorganotin compounds that may interact with these life forms. It also would be of value for those paint companies who are manufacturing marine paints to assist them in determining which organotin compounds to use.

The overall objectives of this research program are to investigate the tin species that are produced in clay, a component of sediments, when reacting with tributyltin (TBT) and triphenyltin (TPT) compounds that are used as antifoulants in marine paints. The speciation of the compounds in the clay will be determined using Mössbauer spectroscopy, which permits direct examination of the tin compounds in the clay. The clays being examined are those found in the sediments in the Anacostia and Potomac Rivers. The clays will be also be suspended in aqueous media of different pHs and salinity.

The proposed research is also designed to provide training of students at the University of the District of Columbia and The Catholic University of America in the performance of the type of research that is being undertaken at government, industrial, and university laboratories.