

## Abstract

Organotin compounds (OTCs) are the compounds that have at least one C- Sn bond. Some of the organotin compounds are hazardous to the environment. This is particularly true for tributyltin chloride (TBTCI) which has been used as antifouling agent on painting of the ships. This compound caused hazardous problems for marine environment. In this work, photo-degradation of this compound in water was performed by ultraviolet irradiation, ultraviolet irradiation in the presence of TiO<sub>2</sub> and ultraviolet irradiation in the presence of a mixture of TiO<sub>2</sub> and polyoxometallate (POM). The rate of photo-degradation reaction of TBTCI was investigated and rate of reactions were measured and compared to similar degradation investigated. The photo-catalytic activity of different types of nano TiO<sub>2</sub> namely anatase, rutile and Degussa P<sub>25</sub> for the degradation of TBTCI was also investigated and the rate constant of the reactions were measured and discussed.

The second part of this dissertation involved the preparation and structural study of a series of dibutyltin carboxylates and dibutyltin complexes of Schiff bases namely [2-Salicylideneiminato-2-(hydroxymethyl)-1, 3-dihydroxypropane] (saltris) , 5-chlorosaltris, 5-bromo saltris, and 5-nitrosaltris. These complexes were characterized by melting point determination, elemental analysis, IR and <sup>1</sup>H, <sup>13</sup>C and <sup>119</sup>Sn NMR spectroscopies. Single-crystal X-ray diffraction was used to study and analyse the molecular structures of three organotin compounds prepared.