

**ASSESSMENT OF BUTYL TIN COMPOUNDS IN WATER AND SEDIMENT  
MATRICES ALONG KILINDINI HARBOUR, MOMBASA COUNTY KENYA**

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156/OL/14770/09  
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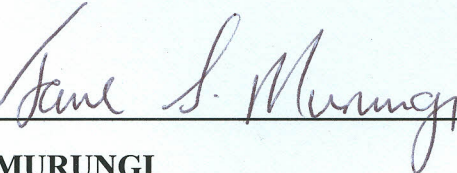
**SIGNATURE**  **DATE** 11/06/2014

**A research proposal submitted in partial fulfillment of the requirements for the award of  
the degree of Master of Science in Applied Analytical Chemistry in the School of Pure and  
Applied Sciences of Kenyatta University**

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**June 2014**

## **ABSTRACT**

Tributyltin (TBT) is an organotin compound used primarily as biocide in antifouling paints to prevent colonization by barnacles and drag-inducing taxa on ship hulls. It is extremely toxic to aquatic life and it is an endocrine – disrupting chemical that causes severe irreversible reproductive effects in aquatic organisms such as imposex. Human toxicology of tributyltins include, disturbance of smell sense, neural necrosis, hepatic lesions and interference with immune system. The TBT is relatively stable and resistant to natural degradation in water and sediment. Because of its chemical properties and wide spread use as antifouling agent, concerns have been raised over the risks it poses to both freshwater and salt water organisms. Therefore, continued monitoring and control of TBT in water ways is necessary all over the world. The TBT derivatives include monobutyltin (MBT) and dibutyltin (DBT) which are used as heat and light stabilizers in manufacture of PVC and polyurethane foams. Kilindini harbor has been receiving ships since 1896, and is the gateway to Eastern Africa. There is thus a high chance of TBT and its derivatives being found in the harbor. Studies on TBT and its derivatives along Kenyan coastline have not been reported. Therefore the study proposes to determine TBT and its derivatives in water and sediments at the Kilindini harbour. Purposive study design will be used in sampling. The water and sediment samples will be collected from Kilindini harbor and analyzed for TBT, DBT and MBT using gas chromatography-mass spectrometry (GC-MS). The data will be analyzed using special excel software computer package and analysis of variance (ANOVA) used to determine the variation in the levels of TBT and its derivatives in water and sediment matrices. The results will be availed to relevant authorities and used to sensitize the public.

## Abbreviation and Acronyms

AAS	Atomic absorption spectrometry
CRM	Certified reference material
DBT	Dibutyltin
USEPA	United States Environmental protection agencies
EU	European Union
GC - MS	Gas chromatography - mass spectroscopy
GPS	Global positioning system
HELCOM	Helsinki committee
HPLC	High performance liquid chromatography
ICP – MS	Inductively coupled plasma – mass spectroscopy
IMO	International maritime organization
KPA	Kenya ports authority
LC, 50%	Lethal concentration on 50% population
MBT	Monobutyltin
NZ	Newzealand
PVC	Polyvinyl chloride
STEPS	Sodium tetraethyl borate
TBT	Tributyltin
TPT	Triphenyltin