

A METHOD FOR TREATMENT OF CONTAMINATED DREDGED SEDIMENT: ELECTROLYSIS COMBINED WITH STABILIZATION AND SOLIDIFICATION

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Abstract

Contaminated sediment is a worldwide concern. In ports, where large quantities of sediment need to be managed, the level of contaminants limits the possibility to use the dredged sediment. New legislations have reduced the possibility to dispose of sediment in landfills and out at sea, and are instead encouraging the use of the dredged masses. A method that enables the use of fine-grained sediment in construction is the stabilization and solidification technique (S/S). If contaminants are removed prior to stabilization, the stabilized sediment may leach less contaminants. Electrochemical treatment is a potential treatment technique that has the potential to degrade organic contaminants and recover metals.

Electrochemical treatment was tested at laboratory scale to degrade toxic tributyltin (TBT) and remove metals from marine sediment. After the electrolysis, the sediment was stabilized using the S/S technique, and the effect of electrochemical pretreatment on the strength and leaching properties of the stabilized sediment was investigated. Finally, the climate impacts of the investigated methods are assessed depending on the metal content in the sediment. The results indicate that electrochemical pretreatment could be done to lower the leaching of contaminants from S/S sediment and that the metal recovery could be beneficial, especially if the sediment is heavily contaminated with metals.

Keywords: Sediment, Tributyltin (TBT), Copper (Cu), Zinc (Zn), Stabilization and solidification (S/S), Environmental assessment