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POLLUTED SEDIMENTS IN ARCTIC HARBORS AND ELECTRODIALYTIC REMEDIATION

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Abstract

International focus on the Arctic environment has increased during the past decade due to the environmental and geopolitical changes in the region. The Arctic is a major focus for long-range atmospheric transport of pollutants from industrial regions at mid-latitudes. For example, compared to the background, the Pb concentrations in recent Greenlandic lake sediments have increased about 2.5-fold, with slightly higher enrichments towards the coast, where annual precipitation is highest [1]

Accumulation of persistent pollutants in the environment as well as bioaccumulation in the food chain of Arctic mammals has been reported [2]. Also human accumulation of persistent pollutants has been found [3], and the situation calls for action. Eventhough long-range transport of pollutants overall plays a major role, locally point sources can also be of major importance.

Local sources for pollution are among others harbour areas, where the sediment can be polluted from different anthropogenic activities. The present work summarizes findings from previous investigations (e.g. [4], [5], [6]) on pollution levels and spreading in the two Arctic harbours Hammerfest, Norway and Sisimiut, Greenland. The sediments from both harbours were polluted with organic compounds and heavy metals. Organic pollutants and heavy metals were generally found to correlate to sediment characteristics; however, TBT was an exception and did not follow this pattern.

To hinder further spreading of the polluted harbour sediments remediation is needed. The method investigated in this work is electrodialytic remediation for heavy metal contaminated sediments. Experimental results from previous work is compiled (e.g. [7], [8]) and major conclusions are drawn. Clean up target levels were met in several experiments.

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