



SOLIDIFICATION AND STABILIZATION OF OIL DRILL CUTTING MUD WASTE USING PORTLAND CEMENT(PC) AND POROTHERM RED BRICKS POWDER (PRB) WASTE

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Abstract

In this study, solidification/stabilization (S/S) of heavy metals (HMs) (lead, (Pb); copper, (Cu); zinc, (Zn); nickel, (Ni); and chromium, (Cr)) using mixture of Portland cement (PC) 15% and Porotherm red bricks (PRB) powder waste with a ratio of (5, 10 and 15%) resultant (3:1, 3:2 and 3:3) cement/Porotherm solid monolith and degraded ones with three replicates was carried out. Physical and chemical characteristics were investigated. The physical characteristics studied were bulk density and unconfined compressive strength (UCS) while chemical characteristics studied were leachability of those aforementioned HMs using Toxicity Characteristics Leaching Procedure (TCLP) and the change in leachate pH. Results indicated the optimum mix design for the S/S system of HMs drilling fluid using both PC and PRB at the experimental conditions in terms of reuse of PRB waste in s/s. However, the study showed that three levels of mixes studied (5%, 10%, and 15%) were able to immobilize the HMs at very low concentration far beyond the regulatory limits by (US EPA). The UCS at above mentioned concentration was 0.811, 4.21 5.1 Mpa respectively and PRB waste powder was effective to reduce HMs leachability and increase compressive strength.

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Solidification, Stabilization, Mud Waste, Portland Cement, Porotherm Red Bricks

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