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REMOVAL OF OIL FROM OILY SLUDGE BY MICRO-EMULSION METHOD

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Abstract

At present, the production of oily sludge is huge, and the micro-emulsion method can effectively separate crude oil and water from the oily sludge by reducing the interfacial tension between oil and cement. In this paper, the micro-emulsion was prepared by using surfactants, such as sodium dodecyl benzene sulfonate (SDBS), cetyltrimethylammonium chloride (CTAB), sodium dodecyl sulfonate (SDS), sodium cetyl sulfate (CAS), and alkylphenol polyoxyethylene ether (OP-10) as the main raw materials. The influence of the following on the deoiling effect were investigated: amount of micro-emulsion added, type and formulation of the surfactant; and treatment temperature, centrifugation period and speed. Results showed that the micro-emulsion prepared from SDBS and OP-10 had the best deoiling effect on oily sludge. Under 45 °C treatment temperature, 10 min centrifugation period and 3600 r/min centrifugation speed, the deoiling rate reached 97.35%, when the micro-emulsion was compounded at a ratio of 2:1. Moreover, the deoiling effect was better than that of other surfactants and composite surfactants. The surfactant type and micro-emulsion treatment temperature considerably influenced the deoiling effect. The micro-emulsion conditioning and centrifugation treatment could effectively separate the three phases (oil, water, and mud). Thermal analysis and SEM microscopic analysis showed that crude oil and water in the oil sludge were largely removed by treatment with quenching and tempering centrifugation with microemulsion.

Keywords: deoiling, micro-emulsion, oily sludge quenching and tempering-mechanical centrifugation

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