

Petroleum Sludge Waste Treatment through Combined Processes of Ultrasonic Irradiation, Solvent Extraction and Co-pyrolysis

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The treatment of petroleum sludge waste generated from oil and gas industry has received increasing concerns in recent years due to its hazardous nature. It is a complex emulsion of various petroleum hydrocarbons (PHCs), water, solid particles, and minerals. Given the stringent environmental regulations, there is a pressing need to develop cost-effective sludge treatment methods. In this presentation, the main methods used for petroleum sludge waste treatment will be reviewed, and the combined processes based on ultrasonic irradiation, solvent extraction, and co-pyrolysis will then be introduced. These include ultrasonic assisted solvent extraction, integrated solvent extraction and freeze/thaw, and the co-pyrolysis of sludge with wood waste. The effectiveness of the combined processes as comparison to other conventional methods will be examined, and the immobilization of heavy metals in sludge treatment will also be discussed.