

**Influence of centrifuging conditions for sustainable recovery of fuel from oily sludge**

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One of the most troubling wasted products in both upstream and downstream petroleum industry is oily sludge. Oil sludge is generated in huge amounts through refining, exploration, storage, pipeline and tanker transportation. Such sludge, containing considerable amounts of hydrocarbons, solids, heavy metals, water and some impurities, presents a stable emulsion, which is difficult to treat. An adequate treatment prevents environmental pollution, protect public health, installation, disrupt operation, and preserves an adequate tank capacity. On other hand, oil sludge still contains valuable fuel and water, hence in spite of difficulties, the recovery of resources from sludge is a sustainable generation of fuels and recycling water. Centrifuging is one of the available technologies which is able to break the sludge suspension into phases, while fuel can be recovered. Another separated fractions, such as water and solids, can be treated, reused or disposed in an efficient way. In order to optimize phase separation and help in fraction recovery, the centrifuging process should considered: reduction of viscosity, preserving an adequate rotation speed, in combination with additives (e.g. organic solvents, demulsifying agents, etc.) and direct heating. The objectives of this study is to improve the oil sludge phase separation and fuel recovery using centrifuging and various conditioning methods. The results showed that the centrifuging process was the most efficient when the pre-treatment with such additives like ferric chloride, ferrous sulfate and surfactant Tween 80, were applied and supported by a high speed. Furthermore, the study also showed that centrifuging three-phases separation was more affective when combined with pre-heating, particularly at 55°C.



Figure 1: Separated phases in oily sludge after centrifuging with the effects of additives and pre-heating.

**Recent Publications**

1. Hu G, Li J and Zeng G (2013) Recent development in the treatment of oily sludge from petroleum industry: a review. *Journal of Hazardous Materials*. 261C:470-490.
2. Islam B (2015) Petroleum sludge, its treatment and disposal: a review. *Int. J. Chem. Sci.* 13(4):1584-1602.
3. Wang Y et al. (2017) Analysis of oil content in drying petroleum sludge of tank bottom. *International Journal of Hydrogen Energy*. 42(29):18681-18684.

**Biography**

Nazanin Motevali is a graduate student in the Department of Building, Civil and Environmental Engineering at Concordia University in Montreal, Canada. She did her bachelor's in Chemical and Petrochemical Engineering. The focus of her graduate research is improvement of management of oily waste generated by petroleum industry. She has an experience working in chemical and environmental laboratories. An important number of tests and analysis were performed by authors in this project.

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