

## عنوان مقاله:

A novel method for recovery of acidic sludge of used-motor oil reprocessing industries to bitumen using bentonite and SBS

## محل انتشار:

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## خلاصه مقاله:

Acidic sludge is a by-product from used motor oil reprocessing industries, which thousand tons of this sludge are disposed into the environment as a hazardous waste material daily. The acidic sludge contains unsaturated compounds that are polar and asphaltene. The bitumen under certain conditions is produced from mixing of bentonite, polymer styrene – butadiene – styrene (SBS), and acidic sludge. Context and purpose: The objective of this study was the recovery of acidic sludge to bitumen using additives such as bentonite and SBS. Also, the effect of additives with different weight percentages (wt%) on the performance parameters of bitumen was evaluated. At first, spilled oil was separated from the acidic sludge by a centrifugal concentrator. Then, concentrated acidic sludge and additives were mixed in together. Finally, the performance tests were carried out to compare the quality of acidic sludge with the obtained products. The results indicated that performance parameters such as softening point (SP), weight loss, penetration degree, PI, Frass breaking point, and temperature susceptibility (TS) were promoted from 37°C, 1.3%, 230 dmm, -0.07854, -5°C and 0.0451 to 54°C, 1%, 130 dmm, 2.7094, -11°C, 0.02721, respectively. According to the paired sample t-test analysis, a significant difference was found between the bentonite dosage and the improved performance parameters from concentrated acidic sludge and obtained products ( $p\text{-value} \leq 0.001$ ). The bentonite and SBS with 2 and 4 wt%, respectively were determined as the suitable additives in the recovery of acidic sludge to bitumen.

## کلمات کلیدی:

Acidic sludge- Bitumen- SBS polymer- Used motor oil

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