

Low Sulfur Diesel-Like Fuel From Quick Remediation Process of Waste Oil Sludge

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Abstract : A quick process may be needed to get the benefit the big generated quantity of waste oil sludge (WOS). The process includes the mixing process of WOS with commercial diesel fuel. Different ratios of WOS to diesel fuel were prepared ranging 1:1 to 20:1 by mass. The mixture was continuously mixing for 10 minutes using bench type overhead stirrer and followed by filtration process to separate the soil waste from filtrate oil product. The quantity and the physical properties of the oil filtrate were measured. It was found that the addition of up to 15% WOS to diesel fuel was accepted without dramatic changes to the properties of diesel fuel. The amount of waste oil sludge was decreased by about 60% by mass. This means that about 60 % of the mass of sludge was recovered as light fuel oil. The physical properties of the resulting fuel from 10% sludge mixing ratio showed that the specific gravity, ash content, carbon residue, asphaltene content, viscosity, diesel index, cetane number, and calorific value were affected slightly. The color was changed to light black color. The sulfur content was increased also. This requires other processes to reduce the sulfur content of the resulting light fuel. A new desulfurization process was achieved using adsorption techniques with activated biomaterial to reduce the sulfur content to acceptable limits. Adsorption process by $ZnCl_2$ activated date palm kernel powder was effective for improvement of the physical properties of diesel like fuel. The final sulfur content was increased to 0.185 wt%. This diesel like fuel can be used in all tractors, buses, tracks inside and outside the refineries. The solid remaining seems to be smooth and can be mixed with asphalt mixture for asphaltting the roads or can be used with other materials as an asphalt coating material for constructed buildings. Through this process, valuable fuel has been recovered, and the amount of waste material had decreased.

Keywords : oil sludge, diesel fuel, blending process, filtration process

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