

**NEUTRALIZATION OF ACIDIC PETROLUUM CRUDE OIL
UTILIZING 2-METHYLIMIDAZOLE LIQUID WITH AID OF
Cu/Ce/Al₂O₃ CATALYST**

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JANUARY 2017

ABSTRACT

Neutralization of Acidic Petroleum Crude Oil Utilizing 2-Methylimidazole with the Aid of Cu/Ce (10:90)/Al₂O₃ Catalyst

Naphthenic acid (NA) present in crude oil leads to corrosion problems within oil refineries. The objective of this study is to reduce total acid number (TAN) of petroleum crude oil using 2-methylimidazole with the aid of Cu/Ce (10:90)/Al₂O₃ catalyst through the catalytic deacidification technique. Catalytic deacidification is a fascinating process to reduce the naphthenic acids (NAs) concentration of acidic petroleum crude because these acids caused lower the quality of crude oils. Petronas Penapisan Melaka (PPM) crude oil with original Total Acid Number (TAN) of 2.43 mg KOH/g was used to test the performance of catalytic deacidification. A basic chemical with a dosing of 10% of 2-methylimidazole in ethanol solution was used as the acid removal agent. Cerium oxide based catalysts supported onto alumina prepared with different calcination temperatures of 800°C, 900°C and 1000°C. The potential catalyst was characterized by using TGA-DTG, FTIR and XRD for its physicochemical properties. The results showed TAN reduced to 0.53 mg KOH/g with 78.2% reduction by using Cu/Ce (10:90)/Al₂O₃ calcined at 900°C, 0.5% of catalyst loading (4 beads), reaction temperature at 27°C and reaction times of 10 minutes. The small particle size of catalyst calcined at 900°C which is 18.02 nm lead to bigger surface areas that enhance the catalytic deacidification process. These properties contributed to the excellent catalytic performance which remove the NAs in the PPM crude oil and concurrently reduced the TAN value below than one.

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