

**REMOVAL OF NAPHTENIC ACID FROM PETROLUEM CRUDE OIL
UTILIZING 2-METHYLIMIDAZOLE LIQUID WITH THE AID OF
Ca/Al₂O₃ AND Ce/Al₂O₃ CATALYST**

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ABSTRACT

REMOVAL OF NAPHTHENIC ACID FROM PETROLEUM CRUDE OIL UTILIZING 2-METHYLIMIDAZOLE WITH THE AID OF Ca/Al₂O₃ and Ce/Al₂O₃ CATALYST

Naphthenic acid (NA) is a carboxylic acid derivative compound commonly found in the petroleum crude oil. The presence of these compounds contributes to the acidity of crude oils and is one of the major sources of corrosion in oil pipelines and distillation units in crude oil refineries. Removing NA compounds from crude oils is regarded as one of the most crucial processes in heavy oil upgrading. In order to overcome this problem, catalytic deacidification method had been developed and used to reduce the total acid number values in crude oil. In this study, crude oil from Petronas Penapisan Melaka were investigated. The parameters used in this study were different catalyst calcination temperatures, catalyst loading, concentration reagent, reaction times and reaction temperature. 2-methylimidazole and ethanol was used as acid removal agent and monometallic calcium and cerium doped with alumina as a catalyst. The results showed that with the catalyst, the reduction of original TAN that was 2.43 mg KOH/g can be reduced to lower than 1 mg KOH/g. Ca/Al₂O₃ with a calcination temperature of 900°C gave a better reduction than Ce/Al₂O₃ with a calcination temperature of 900°C with 83.54% of TAN reduction (2.43 to 0.4) for Ca/Al₂O₃ catalyst and 71.19% (2.43 to 0.7) for Ce/Al₂O₃ catalyst. The best catalyst underwent several characterization methods such as X-Ray Diffraction Spectroscopy (XRD), Fourier Transform Infrared Spectroscopy (FTIR) and Thermogravimetry Analysis (TGA-DTA) for its physicochemical properties. It can be concluded that catalytic deacidification method was efficient and effective in removing NA from the crude oil thus lowering the TAN value less than 1 mg KOH/g.

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