ChemTech

International Journal of ChemTech Research
CODEN(USA): IJCRGG, ISSN: 0974-4290, ISSN(Online):2455-9555
Vol.10 No.1 pp62-70,2017

Nanocomposite of modified montmorillonite K10 with SiO_2-Fe_2O_3as a catalyst of biodiesel synthesis

SerlyJolanda Sekewael[1]*, Karna Wijaya[2], Triyono[2],Arief Budiman[3]

[1]*Department of Chemistry, FMIPA, Pattimura University, Ambon, Indonesia
[2]Department of Chemistry, FMIPA, GadjahMada University, Yogyakarta,Indonesia
[3]Department of Chemical Engineering, Faculty of Engineering, GadjahMada University, Yogyakarta,Indonesia

Abstract: Chemically modified montmorillonite K10 (Mt-K10) with a mixture of SiO_2-Fe_2O_3 oxide was done through the intercalation of silica-iron sol into the interlayer of montmorillonite followed by calcination using microwave radiation 700 W for 10 minutes. Characterization of physical and chemical properties of the reaction product (nanocomposite SFMK-700) and Mt-K10 using XRD, FTIR, BET surface area analyzer (porosimetry), TEM, and SEM-EDAX instruments. Total surface acidity has also been tested.The results showed that the physicochemical modified of Mt-K10 resulted in increased acidity and catalyst activity.The catalyst activity test carried out on lauric acid esterification with methanol (molar ratio of 1:20) in the presence of a 20% (w/w) catalyst. The catalyst SFMK-700 is capable of converting 95.92% lauric acid to form a product of methyl laurate(methyl ester/biodiesel) as much as 93.74% (w/w).

Key words:montmorillonite K10, SiO_2-Fe_2O_3, catalyst of biodiesel synthesis.

*****