

Abstract

The biodiesel production by transesterification of soybean oil and methanol with potassium iodide on silica alumina heterogeneous catalyst was studied and divided in 3 parts. Part I, the catalyst was prepared by the wetness impregnation of potassium iodide solution at the different concentrations of 10 wt%, 15 wt% and 20 wt% on silica alumina. In the preparation, the mixture of silica alumina and potassium iodide solution was stand for 24 hours and calcined at 600°C for 3 hours. Part II, the chemical and physical properties of catalyst was characterized such as basic strength, nitrogen adsorption (B.E.T), x-ray diffraction spectrophotometer and scanning electron microscope. Part III, the optimized condition in transesterification of soybean oil was quantified via the variation of experimental parameters as the concentration of potassium iodide (10 wt%, 15 wt% and 20 wt%), catalyst loading (5 wt%, 10 wt% and 15 wt% of oil weight), reaction temperature (60°C, 65°C and 70°C) and reaction time (8 hours, 10 hours and 12 hours) that affected the conversion of soybean oil to biodiesel.

From the study of biodiesel production via transesterification of soybean oil and methanol by potassium iodide on silica alumina, the optimized condition was 15 wt% of potassium iodide, catalyst loading 15 wt% of oil weight, reaction temperature 70°C and reaction time 10 hours. The conversion 96% of soybean oil to biodiesel was obtained by nuclear magnetic resonance spectroscopy technique.