5th World Congress on

CATALYSIS AND CHEMICAL ENGINEERING

September 05-06, 2018 Tokyo, Japan

Stable zirconia based catalyst for production of biofuels from waste cooking oil with high free fatty acid contents

Rabya Aslam University of the Punjab, Pakistan

Waste cooking oil is valuable and cheap feedstock for the production of bio-fuels as compared to virgin edible oil. It can not only help to reduce environmental impacts of waste cooking oil but also can contribute to the future energy demand. Both alkaline and acidic catalyst may be used for trans-esterification of waste cooking oil to biofuel. In most cases, sodium hydroxide and potassium hydroxide are used as alkaline catalyst and mineral acids are used as acidic catalysts in homogeneous reaction, because of their higher reaction rates, availability and low cost. However, recovery of catalyst is difficult in this process. Moreover, in the case of waste cooking oil which contains relatively high percentage of free fatty acid, alkaline catalysts are prone to the saponification reaction which reduces the biodiesel conversions. In order to cope up with low biofuel conversion, slow reaction rates, activity of solid catalysts are evaluated in this work. The activity of in house synthesized zirconia is studied by varying reaction conditions such as time, temperature, alcohol to oil ratio. Effect of modification of zirconia to increase its alkaline nature is also studied by impregnating Sr, Ca, and Mg metal on zirconia. It was found the alkaline modified zirconia results in better yield as compared to simple zirconia. Additionally, the synthesized biodiesel was fully characterized with respect to density, kinematic density, iodine values, acid values, carbon residue, pour points, flash points, etc. and was compared with literature.

rabya.icet@pu.edu.pk