World Academy of Science, Engineering and Technology
International Journal of Chemical and Materials Engineering
Vol:17, No:06, 2023

Hydrodeoxygenation of Furfural over RU Sub-Nano Particles Supported on Al_2O_3-SIO_2 Mixed Oxides

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Abstract : These last year's our planet has witnessed global warming, which is a serious threat to our lives; it has many causes, such as the CO_2 excess in the atmosphere that results from our activity, for the purpose of living in a neater and better environment, working and improving an eco-responsible energy system is a must. Valorization of biomass to produce biofuels is among the most compelling routes to decrease air pollution without considerable modification in current vehicle technology. Effective transformation of lignocellulosic biomass-derived compounds into liquid fuels and value-added chemicals is an economically viable solution. Presently, very competitive technics for the conversion of lignocellulosic biomass into platform chemicals, such as furfural and Hydroxymethylfurfural (HMF), are used. Furfural ($C_5H_4O_2$) is a major hemi cellulosic biomass-derived platform molecule. In our work, we focus on the valorization of lignocellulosic biomass derivative furfural that is transformed into biofuel through a hydrodeoxygenation reaction in general and involving a catalytic process. In order to get to this point, we are synthesizing and characterizing a series of catalysts with different amounts of Ru (0.5%, 1% and 2%) supported on alumina-silica mixed oxides with various molar ratios (Si/Al = 2.5; 5; 7; 10; 15). These catalysts will be characterized by numerous technics such as N_2 adsorption/desorption, Pyridine adsorption (acidity measure), FTIR, X-rays diffraction, AAS, TEM and SEM.

Keywords : furfural, ruthenium, silica-alumina, biomass, biofuel
Conference Title : ICSCCE 2023 : International Conference on Sustainable Chemistry and Chemical Engineering
Conference Location : Barcelona, Spain
Conference Dates : June 19-20, 2023