Biodiesel production of low grade feedstocks over Zn/Zr mixed metal oxide catalyst

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Heterogeneous solid catalysts comprising ZnO and ZrO2 mixed oxides with various Zn-to-Zr molar ratios were synthesized by means of co-precipitation method. These synthesized mixed oxide catalysts were used for the simultaneous transesterification and esterification of palm sludge oil(PSO) as feedstock with methanol to produce biodiesel at 200℃. The influences of Zn-to-Zr molar ratio, catalyst loading, oil to methanol molar ratio time on the FAME conversion and removal of FFA. In addition, the stability of prepared solid catalysts was studied. These catalysts were characterized by using techniques of X-ray diffraction, FE-SEM. In a single step, Zn-Zr mixed metal oxide catalysts exhibited high catalytic activity(>90%) after 2h of reaction at 200℃.