

ZSM-5 for the synthesis of Li_4SiO_4 for biodiesel production

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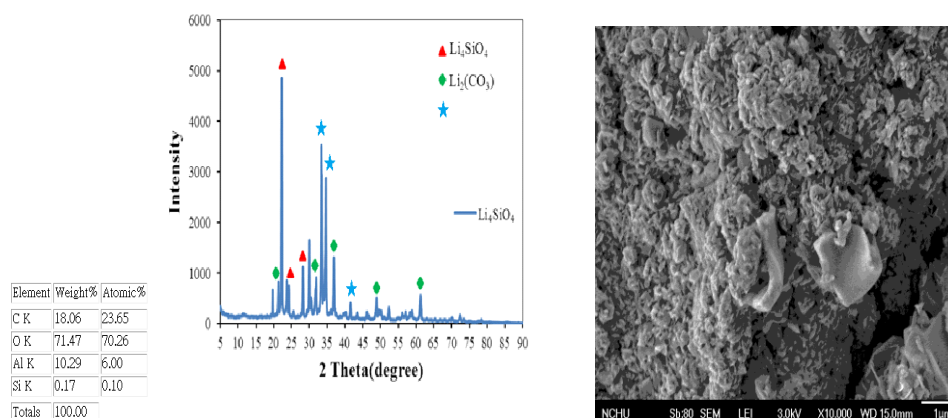
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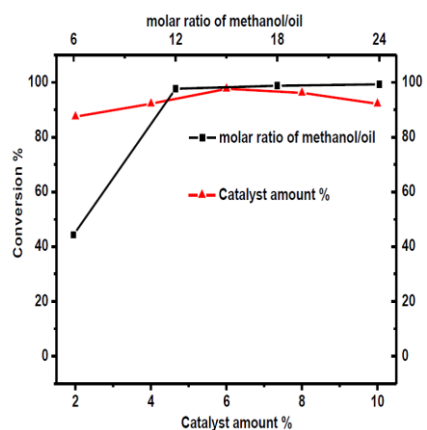
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Using biodiesel for replacing petrodiesel has become the most popular issue in recent years. The purpose of bioresource development is to ease the petroleum exhaustion problem. This study synthesizes biodiesel from soybean oil using transesterification over a lithium orthosilicate (Li_4SiO_4) catalyst. The catalyst is prepared using a simple solid-state reaction, mixing, and grinding ZSM-5 with Li_2CO_3 calcined at 800 °C in air for 4 h. Under the optimal reaction conditions of methanol/oil molar ratio 12:1, 6 % (wt/wt oil) catalyst amount, and a reaction temperature 65°C for 2 h, there is a 97.2 % conversion to biodiesel from soybean oil. The present study also evaluates the effects of methanol/oil ratio, catalyst amount, and reaction time on the conversion. The catalysts are characterized by Scanning electron-microscopy (SEM-EDS), Thermogravimetric analysis (TGA), BET surface area measurements and Hammett indicator method.

Keywords : Lithium Orthosilicate (Li_4SiO_4), Biodiesel, Transesterification, ZSM-5





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