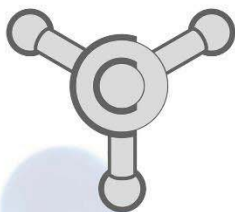


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Seventh Conference of the Young Chemists of Serbia

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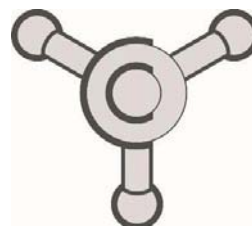
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IAP PP 01

Biodiesel synthesis over green catalyst: The effect of thermal treatment of CaO/Zeolite precursor on catalytic activity

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The green CaO/Zeolite catalyst for methanolysis of fatty oils was synthesized entirely from the waste materials. CaO derived from chicken eggshell was loaded onto fly ash-based zeolite catalyst carrier by the wet impregnation method using an alcohol solution [1]. The effect of thermal activation at different temperatures ranging from 450 to 600 °C on catalytic activity was studied. The precursor and catalyst samples were characterized by XRD, FTIR, SEM, and Hg-porosimetry techniques. The catalytic tests were performed in a stirred batch reactor at the following reaction conditions: 60 °C - reaction temperature, 12:1 - methanol/oil molar ratio, and 4 wt% - catalyst concentration. The obtained results showed that the synthesized CaO/Zeolite catalyst has preserved aluminosilicate framework-cancrinite type [1], with uniformly distributed calcium oxide (CaO) on its surface (Fig. 1c). It is shown that the catalyst sample calcinated at 550 °C exhibited the highest FAME content of 96.46%, which was achieved in 2 h (Fig. 2). Increasing temperature of calcination above 550 °C led to the formation of inactive calcium aluminosilicate forms causing a decrease in the FAME content [2].

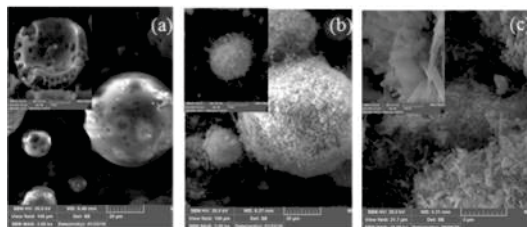


Figure 1. SEM microphages of (a) fly ash (b) Zeolite and (c) CaO/Zeolite-550 catalyst

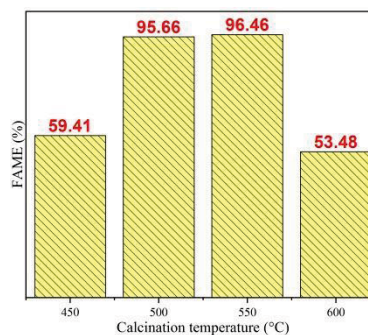


Figure 2. The FAME content after 2 h with catalyst calcined at different temperatures.

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 [2] M. Zdujčić, I. Lukić, Ž. Kesić, et al., *Adv Powder Technol*, **2019**, 30, 1141-1150.

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