ABSTRACT

PRELIMINARY STUDY CONVERSION OF CELLULOSE TO ALCOHOL SUGAR USING LaCrO$_3$ NANOCATALYST

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Sol gel preparation of LaCrO$_3$ nanocatalyst using pectin as emulsifying agent which is calcined at 600 and 700 °C, respectively and catalytic test for cellulose to alcohol sugar have been studied. Then, the calcined materials were characterized using PSA to determine the particle size distribution, XRD to evaluate the phase composition, TEM to analyze the morphology and surface structure in 3-D, and FTIR to analyze the existence of both Lewis and Brönsted-Lowry acid sites. Furthermore, the result of catalytic tests were analyzed using LCMS. PSA proved that particle size of catalyst calsined at 600 and 700 °C respectively has a nanosize with cumulative distribution of 21.91% and 86.40%. FTIR analysis revealed that Lewis acid site is the prominent. The TEM result showed that there were agglomeration. Then, XRD result proved that sample calcined at 700 °C has a single crystalline phase of LaCrO$_3$ and has a particle size of 21.45 nm. Calculated by Scherrer equation. The catalytic test proved that LaCrO$_3$ is active to convert cellulose into sucrose, sorbitol and mannitol, with conversion of 16.66%.

Key words: nanocatalyst, cellulose, alcohol sugar, pectin