

Hydrogen rich gas production by catalytic super critical water gasification of liquefied makgeolli waste over Ni-Y/Activated charcoal catalyst

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In this study we liquefied makgeolli waste by hydrothermal treatment at 310 °C /1h, 1 MPa of N₂ initial pressure and an agitation speed of 500 rpm. The liquefied product was then used as a feedstock in the catalytic supercritical water gasification (SCWG) over Ni-Y/Activated charcoal catalyst at 550 °C and 25 MPa. The SCWG experiment was conducted at three feeding rates; 4, 8 and 12 g/min. The total gas production rate was found to be proportional to feeding rate of the liquefied makgeolli waste feed. Gaseous products rich in hydrogen were produced by the SCWG treatments with a maximum hydrogen content of 47.6 mol% which is suitable as a feed for SOFC systems.

Keywords: Hydrothermal treatment, liquefied Makgeolli waste, Hydrogen rich gas, Catalytic supercritical water gasification.