Effect of reaction conditions on hydrothermal treatment of makgeolli waste

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In this research, the hydrothermal treatment of makgeolli waste obtained in a local Korean manufacture was investigate to understand the influence of reaction conditions on liquefaction. Generally makgeolli waste consists of solid and liquid portions. The solid portion of makgeolli waste consists of unfermented rice/wheat which is rich in carbon while the liquid portion of makgeolli waste is rich in water with 10 vol% of ethanol. In the present work we aimed to increase the dissolved organic matter in water by liquefying the solid portion of makgeolli waste by hydrothermal treatment via optimization of reaction conditions. The hydrothermal treatment was conducted in a stainless steel batch reactor at 150, 210 and 310 °C. The best reaction conditions to obtain more liquid yield and less char are: 150 °C, 30 bar initial nitrogen pressure, 500 rpm agitation speed. The yield of liquid product was slightly increased by KOH addition to makgeolli waste feed.

Keywords: Makgeolli Waste, Hydrothermal treatment, reaction conditions, liquefaction.