

Catalytic hydrothermal conversion of alginate into organic acids under subcritical water conditions

전원진, 반충현, 박건우, 우희철¹, 김도희[†]

서울대학교; ¹부경대학교

(dohkim@snu.ac.kr[†])

The hydrothermal treatment of sodium alginate was performed over solid acid and base catalysts in subcritical water in order to investigate the effects of catalysts on alginate depolymerisation and organic acid production. Under solid acid catalysts, the acid-catalysed hydrothermal decomposition of alginate promoted the production of monomers (mannuronic acid and guluronic acid) and glycolic acid. On the other hand, over solid base catalysts, the lactic acid and dicarboxylic acids (malic acid and fumaric acid) were predominantly produced by the base-catalysed reaction. Regardless of the presence of catalysts, increasing the reaction temperature enhanced both the acid- and base-catalysed reactions via changes in properties of subcritical water. Our study demonstrates that employing solid catalysts for the efficient conversion of alginate is important for the valorization of seaweed-derived biomass.