

Synthesis of porous silica nanoparticles from rice husk biomass: A comparison study of synthesis methods

이진형<sup>1,†</sup>, 권정희<sup>2,1</sup>, 상병인<sup>3</sup>

<sup>1</sup>한국세라믹기술원; <sup>2</sup>한양대학교; <sup>3</sup>한양대학교 화학공학과

(leejinh1@kicet.re.kr<sup>†</sup>)

Rice husk is a bulky biomass with a high silica content from rice production. It usually contains around 10% of silica. The utilization of rice husk has been an extensive research topic for decades. However, practical applications of rice husk have been limited to a narrow range of low-value agricultural items, such as fertilizer additives, stockbreeding rugs and bed soil, because of their tough and abrasive properties.

In this study, we investigated the effects of synthesis methods of biosilica from rice husk on silica content, surface area and pore. To obtain high content of biosilica, rice husk was treated with acids or ionic liquids and burned in a muffle furnace at 800°C until completely removing all incorporated hydrocarbons. High content of biosilica was found in sulfuric acid or 1-butyl-3-methylimidazolium hydrogen sulfate treated samples. All biosilica samples obtained in this study showed mesoporous structures and high surface-to-volume area.