

A novel approach to efficient lignin valorization with thermochemical depolymerization *via*  
liquid-like nanoparticle organic hybrid materials

최소영, 문석훈, 이윤석, 박영준<sup>†</sup>  
광주과학기술원  
(young@gist.ac.kr<sup>†</sup>)

Since climate changes have been the global concerns, significant efforts have been established to reduce the CO<sub>2</sub> emissions. One of the efforts, switching the fossil fuels to the biomass has been attended. Additionally, lignin has conventionally been treated as a waste due to its highly complex structure while it is a good source of aromatic compounds. Therefore, pyrolysis and catalytic conversions with ionic liquid are developed for the cleavage of the typical linkages and conversion to the valuable compounds. Herein, nanoparticle organic hybrid materials (NOHMs), which has recently been studied as an anhydrous nanoparticle fluid system was investigated for a novel selective lignin conversion media. The thermochemical depolymerization of lignin was investigated focusing on the lignin model compounds such as 2-phenoxyethanol, and benzyl phenyl ether which represent  $\beta$ -O-4 and  $\alpha$ -O-5 linkages. For the analyses, ATR FT-IR and 2D COSY NMR spectrometers were adopted. The results indicated the synthesized NOHMs could be an effective catalysis for lignin valorization *via* selectively decomposing the model compounds and producing the multiple valuable materials.