

Efficient Photocatalytic C-C Decoupling of β -O-4 Lignin Model by Cation-coordinated Graphitic Carbon Nitride

김민수, 이도창[†]
한국과학기술원
(dclee@kaist.ac.kr[†])

Graphitic carbon nitride($g\text{-C}_3\text{N}_4$) is the promising green material which can alternate molecular catalysts. Because the Ir, Ru-based molecular catalysts are expensive and harmful, replacement of them is meaningful. Moreover, by carbon-carbon decoupling reaction with $g\text{-C}_3\text{N}_4$, highly value-added products can be given from nature polymer, such as lignin. In this research, carbon-carbon decoupling reaction rate of lignin β -O-4 model is enhanced by maximizing adsorption. Additional adsorption is driven by strong cation- π interaction between aromatic reactants and coordinated cations in $g\text{-C}_3\text{N}_4$ heptazine(tri-s-triazine) melon structure. It is known that cation- π interaction of Li^+ and aromatic ring is strongest, and K^+ ion is weakest among Li, Na, K cations. Li, Na, K cations were doped and the reaction rate enhancement tendency was exhibited according to cation- π interaction strength order. The reaction yield was measured by Gas chromatography, and catalysts were characterized with UV-vis spectroscopy, XRD.