

## Non-covalent Functionalization of Graphene with Ionic Liquids toward Biosensing Application

양민호, 최봉길, 박태정, 홍원희, 이상엽\*

한국과학기술원

(leesy@kaist.ac.kr\*)

Graphene-based hybrid materials that possess a unique nanostructure and fascinating properties have been received much attention to potential applications in synthesizing nanocomposites and fabricating electrochemical devices. Herein we demonstrated that functionalization of graphene with ionic liquids (ILs) through  $\pi$ - $\pi$  interactions provided biosensing platform families for high surface sensitivities by immobilization of glucose oxidase (GOx) on graphene-IL hybrid. The morphology and thickness of graphene/ILs hybrid were confirmed by AFM images, showing two dimensional nanostructures and 2.25 nm thick sheets. The FT-IR spectrum provided good evidence for functionalized graphene with ILs. In order to demonstrate the electrochemical properties of GOx/graphene-IL hybrids, cyclic voltametry and amperometric measurements were carried out in a view of interfacial chemistry. Owing to the fast response time and high biocatalytic activities, GOx/graphene-IL sensor assembly in this report could promise as an advanced electrochemical device for biosensor applications.