Preparation and characterization of $ZnFe_2O_4$ heterostructures as ultra-high sensitive electrode for formaldehyde chemical sensor

김은비, 사디아아민, 신형식, 장광수, 모흐드 나짐,
압둘라, 서형기†
전북대학교
(hkseo@jbnu.ac.kr†)

Zinc ferrite ($ZnFe_2O_4$) heterostructures were synthesized through low temperature solvothermal process. The bulk electrode of $ZnFe_2O_4$ was prepared in the form of pellet and coated with graphene for the effective detection of toxic formaldehyde chemical. The phase purity and composition of $ZnFe_2O_4$ were confirmed by elemental analysis such as Raman Spectroscopy and X-Ray diffraction studies. From room temperature photoluminescence (PL) spectroscopy, the synthesized $ZnFe_2O_4$ exhibited prominent band-edge ultraviolet (UV) and weak visible emission (violet), indicated the optical properties of $ZnFe_2O_4$. The electrochemical revealed that the prepared $ZnFe_2O_4$ heterostructures based electrode showed the sensing response toward formaldehyde. The enhanced electrochemical performances could be attributed to the synergistic effect between $ZnFe_2O_4$ and graphene and the observed results demonstrated $ZnFe_2O_4$ heterostructures as promising probe candidate for the fabrication of highly sensitive and selective chemical sensors.