

Zinc oxide nanopyramids modified screen printed electrode for high sensitive and low-concentration sensor application

김은비, 사디아아민, 장광수, 피자히라미아, 압둘라,  
알람샤바즈, 코타아쉬크, 서형기, 신형식<sup>†</sup>  
전북대학교  
(hsshin@jbnu.ac.kr<sup>†</sup>)

A facile and simple hydrothermal method was used to synthesize the hexagonal zinc oxide nanopyramids (ZnO-NPys) and successfully applied as active materials to modify disposable screen printed electrode (SPE) for detecting the dichloromethane (DCM) chemical. FESEM analysis exhibited a high aspect ratio of hexagonal nanopyramid like structures and the structural studies evidenced that the synthesized materials were well-crystalline with typical wurtzite ZnO crystal. ZnO-NPys modified SPE detected low concentrations of DCM which were measured by a simple cyclic voltammetry (CV) technique. A promising sensitivity of  $\sim 293.5 \mu\text{A}/\mu\text{M}/\text{cm}^{-2}$  with a limit of detection (LOD) of  $\sim 17.3 \mu\text{M}$ , excellent linearity in the range of 100 nM -200  $\mu\text{M}$  and a good retention coefficient (R) of  $\sim 0.982055$  were observed. Thus, it is believed that ZnO-NPys could be a promising candidate for the fabrication of efficient sensors for detecting hazardous chemicals.