

### Fully nozzle-jet printed non-enzymatic electrode for biosensing application

Kiesar Sideeq Bhat, 유진영, 왕유생, Tahmineh Mahmoudi, 양화영, 권대욱, 한윤봉<sup>†</sup>  
전북대학교  
(ybhahn@chonbuk.ac.kr<sup>†</sup>)

Printable electronics is a subject of great interest for low-cost, facile and environmentally-friendly large scale device production. Herein, we report printing of silver (Ag) precursor and copper oxide nanoparticles (CuO NPs) inks by nozzle-jet technique to fabricate non-enzymatic glucose biosensor on flexible polymer substrate. The fully printed CuO NPs/Ag/PET electrodes were characterized using electrochemical techniques for non-enzymatic biosensing of glucose. The fully printed nonenzymatic biosensor exhibited a high sensitivity ( $1424.2 \mu\text{A} \text{mM}^{-1} \text{cm}^{-2}$ ), linear range from 0.1 to 15 mM, low detection limit (0.3  $\mu\text{M}$ ; S/N = 3) and fast response time of  $\sim 2$  s under a working potential of +0.6 V. Additionally, printed electrodes demonstrated an excellent long term stability, high reproducibility, good selectivity and high accuracy during glucose concentration measurements in human blood and serum samples. These results indicate that the electrode fabrication using nozzle-jet printing can be regarded as a potential technique for the future development of high performance and low cost bio/chemical sensor devices.