

Electrochemical detection of hydrogen peroxide based on polyoxometalate-doped polyaniline nanopillar films

김동석, 최봉길<sup>†</sup>, 이석재<sup>1</sup>, 이경균<sup>1</sup>

강원대학교; <sup>1</sup>나노융합기술원

(bgchoi@kangwon.ac.kr<sup>†</sup>)

Most electrochemical sensors depend significantly on biological enzymes, but enzyme based on sensors often suffer from insufficient stability, poor tolerance under experimental conditions, poor reliability, and high cost. So, Electrochemical sensors development for the better electrochemical performances is key point that design and fabrication of electrode. Herein, enzymeless electrochemical sensors have propose as alternatives for detection of hydrogen peroxide based on the use of highly ordered polyoxometalate (POM)-doped polyaniline (PANI) nanopillar films. The POM and PANI were electrodeposited simultaneously onto nanopillar filmes. During the in-situ electropolymerization of aniline, POMs were entrapped in PANI matrix. Electrochemical measurement of POM-PANI/nanopillar electrode showed well-defined multiple pairs of redox peaks and rapid electron transfer. The diffusion of electrolyte and enhanced the redox reaction facilitated owing to nanopillar structure. The POM-PANI/nanopillar electrode was incorporated into a flow injection biosensor and showed that electrocatalytic activity to detect hydrogen peroxide with high sensitivity, rapid response time, and low detection limit.