

## Facile Fabrication of Polyaniline Films with Hierarchical Porous Networks for Enhanced Electrochemical Activity

김지혜, 구형준<sup>†</sup>, 소주희<sup>1</sup>, 김성곤<sup>2</sup>, 윤현식, 최종훈<sup>3</sup>

서울과학기술대학교; <sup>1</sup>한국생산기술연구원; <sup>2</sup>

전북대학교; <sup>3</sup>중앙대학교

(hjkoo@seoultech.ac.kr<sup>†</sup>)

A conducting polymer with well-defined porous structures would be preferred as an electrode of a capacitor. Upon crosslinking with phytic acid, polyaniline (PANI) forms a hydrogel with a 3-D porous structure. In this study, we checked the effect on its pore morphology and electrical property of PANI with various compositions. It turns out that the composition in preparation has a significant influence on the morphology of the PANI hydrogel. As ratio of initiator/crosslinker increase or monomer decreases, the PANI hydrogel has denser morphology with decreased pore size and high volumetric surface area, resulting in higher conductivity. So, in the 3-electrode system, the PANI hydrogel electrode prepared at optimized compositions exhibited 105.6 F/cm<sup>3</sup> of capacitance with ~50% retention rate after 5000cycles. Finally, we fabricated a practical capacitor with two symmetric PANI hydrogel electrodes, which shows 271.4 F/cm<sup>3</sup> of capacitance with improved cycle stability of 80% retention rate.