

Low cost and environmental friendly all-solid-state flexible supercapacitor composed of lignin based electrode and electrolyte

박정희, RANA, 박호석<sup>†</sup>  
성균관대학교  
(phs0727@skku.edu<sup>†</sup>)

The implementation of high performance energy storage devices into electric and hybrid electric vehicles and portable electronic devices creates a huge demand for efficient, economical and sustainable materials for energy storage. However, electrode preparation time and cost are the two big constraints for realizing low cost-high performance energy storage devices. Lignin being inexpensive material possesses numerous attractive properties, such as high carbon content, biodegradability, antioxidant activity and favorable functionality. These advantages have motivated us in developing all lignin-based energy storage device. Here we have prepared PAN incorporated Lignin nanofiber as electrode material. Additionally, presence of excess of phenolic and other functional groups have been used to crosslink it with other crosslinker to form lignin-based hydrogel electrolyte. By combining the lignin-PAN nanofiber electrode and crosslinked lignin-based hydrogel electrolyte we have fabricated flexible supercapacitor (f-SC). Structural, morphological and electrochemical characterization of electrode and electrolyte and f-SC device was carried out.