The Agarose/Spherical Activated Carbon Composite Hydrogel Electrode with Imporved Electrical Properties

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For flexible electrodes, electrode materials based on metals are not suitable. Nowadays, studies have actively been conducted on three-dimentional, flexible, portable, self-healing, and printable electrodes using the conducting polymers. Among the various soft materials, the agarose is a natural hydrophilic polymer and forms a hydrogel. The agarose has a characteristic of thermal sol-gel transition which enables reversible shape configuration of materials. In this study, we develop a hydrogel electrode by using agar/spherical activated carbon (SAC) composites. Using reversible thermal sol-gel transition of agar/SAC composite gel, we make various shapes of agar/SAC composite gels for demonstrating as a shape configurable agar/SAC composite electrode. In addition, quantative analysis for electrical properties of Agar/SAC composites proves that conductivity of composite gels can be measured to 51.06 mS/m. Finally, we demonstrate that agar/SAC compositie gel is used as a electrodes with a simple electric circuit system.