



Three-dimensional Printing of Supercapacitors based on Different Electrodes

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Abstract

A fused deposition modeling (FDM) printing machine and a paste extrusion system were integrated, and supercapacitor samples were fabricated using a combination of two three-dimensional (3D) printing techniques. The FDM provided a simple method for creating a frame of electric double layer capacitor (EDLC) samples. The paste extrusion system offered the possibility of depositing different materials to complete the functions of the EDLC samples. A combination of these two 3D printing methods offered one continuous manufacturing process with a high accuracy of manufacturing. Different materials were used to build current collectors and electrodes. Silver and carbon conductive paints were used as current collector materials. Different electrode materials based on activated carbon (AC), carbon conductive paint, and their combination were prepared as three different slurries and deposited to form the electrodes of EDLC samples. The results showed that silver conductive paint was a suitable material for constructing current collectors, and carbon conductive paint mixed with AC was highly effective for use as an electrode material for supercapacitors.

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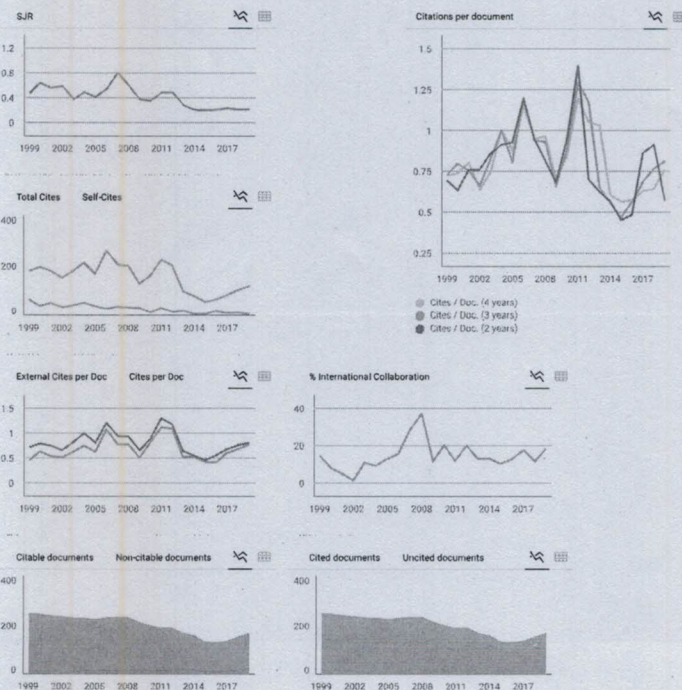
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