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Flexible all - solid state supercapacitors fabricated by electrophoretic deposition

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Flexible supercapacitors have been of significant interest because of their practical applications in bendable and wearable electronics such as electronic papers, collapsible displays and power supplies for stretchable electronics. Flexible solid state supercapacitors have several advantages compared to conventional ones; they have small size, low weight, ease of handling, excellent reliability and a wide range of operating temperatures. Herein, we will discuss the fabrication, by electrophoretic deposition (EPD), of flexible all-solid-state symmetric supercapacitors, comprised of holey reduced graphene oxide – transition metal oxides. Holey reduced graphene oxide – transition metal oxides films were electrophoretically deposited in a layer-by-layer fashion onto targeted substrates. The resulting symmetric supercapacitors, using different gel electrolytes, exhibited excellent electrochemical capacitive performance. Furthermore, the supercapacitors exhibited long-term cycling stability and outstanding volumetric energy density. Considering the facile scale-up capability of the EPD process, our approach paves a promising route for the next- generation of flexible all-solid-state supercapacitors with high energy density and power density.

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