Exploring the Synthesis and Energy Storage Applications of Graphene

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Graphene is the ultimate two-dimensional material consisting of a single layer of sp2 hybridized carbon. A facile, inexpensive, solid-state method for generating, patterning and electronic tuning of laser converted graphene will be discussed (**Figure 1**). Briefly, graphite can be converted into graphene oxide (GO) sheets, which readily disperse in water, and can then be reduced by various methods. Due to its unique ability to be solution processed and patterned, GO can be laser reduced to graphene directly onto various substrates without masks, templates, post processing, or transfer techniques. This work paves the way for the fabrication of inexpensive electrochemical energy storage devices that combine the energy density of batteries and the power density of capacitors.

**b**

**c**

**a**

**Figure 1** **(a)** Schematic showing the fabrication process of a graphene micro-supercapacitor using a Light Scribe DVD drive. **(b,c)** This technique can create more than 100 micro-devices in a single run on virtually any substrate.

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