Synthesis and Applications of Graphene

Richard B. Kaner
Maher El-Kady, Jeeyoun Hwang, Mengping Li, Haosen Wang, Matt Kowal, Yuanlong Shao and Reza Rizvi
Department of Chemistry & Biochemistry, Department of Materials Science & Engineering, and California NanoSystems Institute, University of California, Los Angeles (UCLA), Los Angeles, CA 90095, USA
kaner@chem.ucla.edu

Graphene is the ultimate two-dimensional material consisting of a single layer of sp^2 hybridized carbon. Here we explore different approaches to synthesize this carbon allotrope, ranging from chemical conversion to vapor phase deposition. Briefly, graphite can be converted into graphene oxide (GO) sheets, which readily disperse in water, and then can be reduced by various methods.[1] Due to its unique ability to be solution processed and patterned, GO and chemically converted graphene hold promise for applications ranging from sensors to transparent conducting electrodes. Chemical vapor deposition onto metal substrates enables the growth of continuous, large-area graphene (**Fig. 1**). The challenges of growing graphene, controlling the number of layers, transferring graphene and some exciting uses such as laser scribed graphene for supercapacitors will be discussed.[2-5]

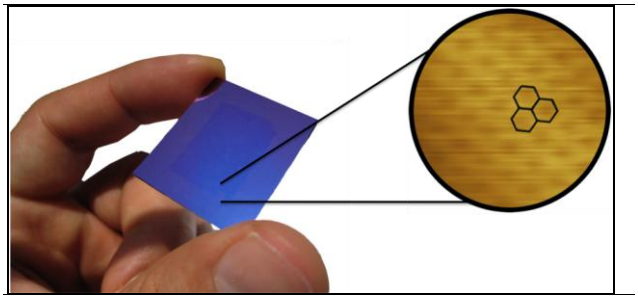

Figure 1: An optical and an AFM image of graphene grown by CVD.

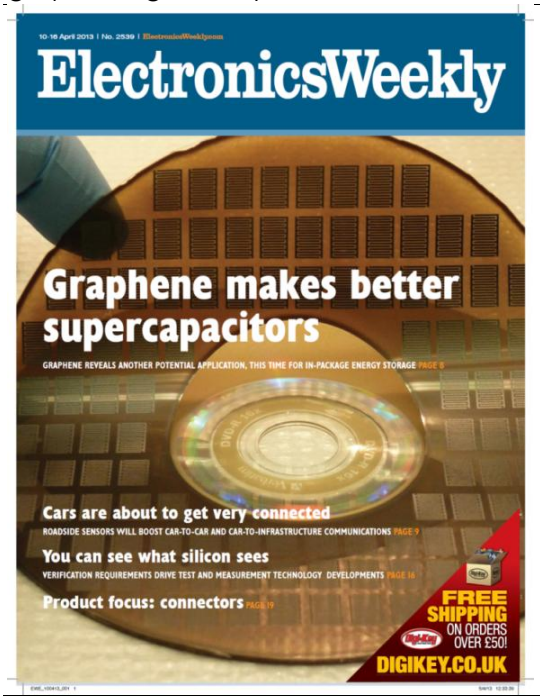

Figure 2: Over 100 graphene micro-supercapcitors can be made on a compact disc using a 780 nm laser.

References

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