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**Facile and Scalable Route to Wafer-Size Patterned Graphene** LI-HONG LIU, MINGDI YAN — Graphene-based nanoelectronic devices are promising as an alternative to silicon-based nanodevices in the future. Producing graphene sheets and patterned structures as device building blocks is an important step to graphene-based nanodevice fabrication. It is highly desirable to assemble graphene sheets at specific locations and into desired patterns on large scale. Several methods have been reported for patterning graphene nanostructure. However, all of these methods involve either sophisticated instruments or were rather high cost and low throughput, hindering their large-scale fabrication and practical applications. We developed a simple and efficient method to covalently immobilize graphene on silicon wafers. Patterned structures were fabricated where the feature sizes could be conveniently controlled from micron to millimeters. The formation of patterned graphene layers was confirmed by Raman spectroscopy, optical and atomic force microscopy. Evidence of covalent bond formation was provided by X-ray photoelectron spectroscopy. In addition, this method can be readily applied to other substrates. This approach represents a new route for solution-based graphene fabrication, allowing graphene sheets and patterned graphene structures to be fabricated on virtually any surface.

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