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Electrostatic Transfer of Monolayer Graphene Grown on Copper Foil ROSHAN CHOXI, JAE WON DO, SCOTT SCHMUCKER, JOSHUA WOOD, JUSTIN KOEPKE, JOSEPH LYDING, University of Illinois at Urbana-Champaign — The growth of graphene on metal substrates, in particular, single-layer graphene on copper, suggests technological applications requiring graphene transfer from the growth substrate. However, it is difficult to transfer a large area of single-layer graphene with high quality, although using a multistep polymethyl-methacrylate (PMMA) based process looks promising. Transferring graphene by etching away the metal graphene growth substrate, as is the case with nickel and copper, can incorporate residues from the wet etching step, affecting graphene quality. Here, we demonstrate a simple method of large-area, single-layer, and high quality graphene transfer by electrostatic force. Using graphene grown by chemical vapor deposition directly on copper foils, we can transfer millimeter-sized, mostly single-layer graphene onto different substrates. We also note transfer of some bilayer graphene. By varying the electrostatic force with different electric fields, this technique furthers our understanding of the interaction between graphene and the copper film. Through Raman spectroscopy, atomic force microscopy, and scanning electron microscopy, we examine the number of defects and wrinkles in the transferred graphene layers, which gives us information about the graphene growth process on copper.

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