

Abstract Submitted  
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**Direct transfer of graphene onto flexible substrates** LUIZ GUSTAVO PIMENTA, Federal University of Minas Gerais, YI SONG, TINGYING ZENG, MILDRED DRESSELHAUS, JING KONG, Massachusetts Institute of Technology, PAULO ARAUJO, Univ of Alabama - Tuscaloosa — We explore the direct transfer via lamination of chemical vapor deposition graphene onto different flexible substrates. The transfer method investigated here is fast, simple, and does not require an intermediate transfer membrane, such as polymethylmethacrylate. Various substrates of general interest in research and industry were studied including polytetrafluoroethylene filter membranes, PVC, cellulose nitrate/cellulose acetate filter membranes, polycarbonate, paraffin, polyethylene terephthalate, paper, and cloth. By comparing the properties of these substrates, two critical factors to ensure a successful transfer on bare substrates were identified: the substrate's hydrophobicity and good contact between the substrate and graphene. For substrates that do not satisfy those requirements, polymethylmethacrylate can be used as a surface modifier or glue to ensure successful transfer. Our results can be applied to facilitate present processes and open up directions for applications of chemical vapor deposition (CVD) graphene on flexible substrates. A broad range of applications of CVD graphene can be envisioned, including fabrication of graphene devices for opto/organic electronics, graphene membranes for gas/liquid separation, and ubiquitous electronics with graphene.

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