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Optimization of multi-layer graphene/PMMA synthesized by low pressure chemical vapor deposition from acetylene precursor

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High quality and large scale graphene are required for large-scale applications, especially transparent conductive flexible touch-screen panels. Chemical vapor deposition is so far the best method for the synthesis of high quality graphene in the large scale. In this work, we have synthesized multi-layer graphene on copper foils by low pressure chemical vapor deposition from acetylene precursor at the flow rate of 20-40 mL/min and with reaction times from 10-30 minutes. Graphene on copper foils were then coated with PMMA and transferred by wet chemical etching method. The transmittance and electrical properties of graphene on polymer were investigated. The Raman spectrum of graphene synthesized with the acetylene flow rate of 30 mL/min for 10 minute showed the characteristics of bi-layer graphene (I_{2D}/I_G is 1.6) with the lowest resistance values and best transmittance compared with other conditions.

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