Abstract Submitted
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Formation of transferable transparent pristine graphene films at water/heptane interface[1] A.J. OYER, J-M.Y. CARRILLO, S.J. WOLTORNIST, D.H. ADAMSON, A.V. DOBRYNIN, University of Connecticut — We present a method of forming one to four layer thick pristine graphene films on glass substrates. These transparent and electrically conductive films are formed from natural graphite without the use of chemical treatment. The films are initially formed at a water/heptane interface and then transferred to a glass slide. Computer simulations of the graphene sheets at water/heptane interface show that the films are metastable, kinetically trapped assemblies. To evaluate stability of the film we used the Weighted Histogram Analysis Method to calculate the potential of the mean force and the height of the local potential barrier for single sheet and double sheet assembly of the graphene at water/heptane interface. The film structure on a glass slides was analyzed by Raman spectroscopy, optical microscopy, and transmission electron microscopy. These measurements show that the films are composed of overlapping graphene sheets one to four layers thick covering approximately 80% of the substrate. These low cost films are expected to find applications in the economical replacement of current inorganic transparent conductive films.

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