

Abstract Submitted
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CVD Growth Studies of Graphene on Cu(111)¹ HEIKE GEISLER, SEAMUS MURRAY, SUNY College at Oneonta, ENG WEN ONG, ZACHARY R. ROBINSON, TYLER R. MOWLL, PARUL TYAGI, CARL A. VENTRICE, JR., SUNY College of Nanoscale Science and Engineering — Because of its unique chemical and physical properties, graphene shows great promise for use in a wide variety of technological applications. However, Industry has not been able to widely implement the use of graphene because of the difficulty in growing low-cost, defect-free, large-area graphene films. One method of producing graphene films with a low defect density is to grow epitaxial films on single crystal substrates. A study of the growth of graphene on the Cu(111) surface in UHV was performed with methane and ethylene. With ethylene, no graphene was formed at 900 °C with pressures as high as 5 mTorr. By using an Ar overpressure of 50 mTorr, single-domain epitaxial graphene films could be formed. With methane, no graphene could be formed even with an Ar overpressure. This result indicates that methane has a much lower dissociation probability on the Cu(111) surface than ethylene. In addition, the effect of predosing the surface with a chemisorbed oxygen layer was measured. The oxygen predosing was determined to adversely affect the order of the graphene grains with respect to the Cu(111) substrate.

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