

Abstract Submitted
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Analysis of Substrate Grain Size and Orientation on the Growth of Graphene Films¹ Z.R. ROBINSON, P. TYAGI, T.M. MURRAY, C.A. VENTRICE, JR., CNSE, Univ. at Albany, C. MAGNUSON, D. MUNSON, S. CHEN, R.S. RUOFF, Dept. of Mech. Engr., Univ. of Texas — Graphene growth on Cu foils by catalytic decomposition of methane forms predominately single layer graphene films due to the low solubility of C in Cu. One of the key issues for the use of CVD graphene in device applications is the influence of defects on the transport properties of the graphene. For instance, growth on foil substrates is expected to result in multi-domain graphene growth because of the presence of randomly oriented grains within the foil. Therefore, the size and orientation of the grains within the metal foil should strongly influence the defect density of the graphene. To study this effect, we have initiated a study of the influence of pre-growth anneal time and H₂ pressure on the grain size and structure of Cu and Cu-Ni foil substrates. Preliminary measurements of the grain size have been performed with SEM and AFM. These results show a typical lateral dimension of $\sim 100 \mu\text{m}$ for an anneal time of 30 min in 40 mTorr of H₂ at 1000 °C. Measurements are currently being performed with electron backscatter diffraction to determine the crystallographic orientation within each grain.

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