

Abstract Submitted
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Characterization of Graphene Films Grown on Cu-Ni Foil by XPS¹ P. TYAGI, R.L. MOORE, Z.R. ROBINSON, C.A. VENTRICE, JR., Univ. at Albany, D.D. MOODY, W. PRIYANTHA, R. DROOPAD, Texas State Univ., C. MAGNUSON, D. MUNSON, S. CHEN, R.S. RUOFF, Univ. of Texas — Monolayer graphene films can be grown on Cu substrates by the catalytic decomposition of methane molecules. The solubility of carbon in Cu is negligible at the growth temperatures typically used for graphene growth, which results in the formation of films that self-terminate at a monolayer. In an attempt to enhance the catalytic activity of the surface, use of Cu-Ni alloy foils has been investigated. Growth is performed in a CVD system at a temperature of 1000 ° C with pure CH₄. To determine the graphene coverage and the surface alloy composition during the different phases of growth, XPS measurements have been performed on the Cu-Ni foils before anneal, after anneal in H₂, and after growth of graphene. Analysis of the C-1s core emission for graphene/Cu is used as reference for monolayer growth. Before anneal, the measurements indicate that the surface is Ni-rich and heavily oxidized. After annealing in H₂, only a small amount of oxide remained and the Cu:Ni alloy fraction was similar to the bulk. After growth of the graphene overlayers, only trace amounts of oxygen are present, indicating uniform graphene growth.

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Carl Ventrice
University at Albany-SUNY

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