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Growth and Contrast of Hexagonal Boron Nitride: From Submonolayer Islands to Multilayer Films JUSTIN KOEPKE, JOSHUA WOOD, ERIC POP, JOSEPH LYDING, University of Illinois at Urbana-Champaign — Strong interest in hexagon boron nitride (h-BN) as a substrate for graphene devices [1] or as a template for growth of other layered compounds [2] has motivated recent attempts to synthesize large scale h-BN by chemical vapor deposition (CVD). We synthesize h-BN by low pressure CVD on polycrystalline Cu foil in a hot wall tube furnace with a heated ammonia borane precursor carried downstream by Ar and H_2 gas. Transmission electron microscopy (TEM) diffraction patterns show that the resulting growths are highly crystalline, with several layers obtained for longer growth times. Short growth times show that the h-BN nucleates in triangular islands at a higher precursor temperature than previously reported in [3] and a lower temperature than reported in [4]. In-air calcination of the Cu foils after partial h-BN growth allows optical contrast of the previously transparent h-BN islands on the Cu foil. This observed resistance to oxidation suggests that grown h-BN films can serve as an insulating anti-corrosion layer.

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[2] P. Gehring, et al., Nano Lett. 12, 5137 (2012).
[3] K.K. Kim, et al., *Nano Lett.* 12, 161 (2012).
[4] N. Guo, et al., Nanotechnology. 23, 415605 (2012).

Justin Koepke
University of Illinois at Urbana-Champaign

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