

Abstract Submitted
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Graphitic Carbon Nitride Fabrication ADAM COLLARD, University of Dallas, YANCEN LI, Mentor, JOEL THERRIEN, Advisor — Single atom thickness carbon nitride sheets have been predicted as good high speed semiconductors. However, it is difficult to synthesize large continuous single layer sheets. Although large amorphous multilayer sheets can be produced easily, single layer sheets require a precise deposition method and solution. We synthesized the carbon nitride at the University of Massachusetts Lowell in the Center for High-rate Nanomanufacturing. Synthesis starts by depositing solutions on silicon wafers using various deposition methods. Wafers are then baked in an ultrahigh purity argon environment where ammonia is removed thereby transforming the chemical deposit of Dicyandiamide into carbon nitride. After baking samples they are tested with Raman Spectroscopy and Atomic Force Microscopy. Single atom thickness samples are then patterned using negative photoresist lithography and coated with aluminum. Excess aluminum is removed and the samples are probed to test band gap and resistivity. Difficulties were encountered in finding a good solvent, proper concentration, and deposition method that worked. The synthesis techniques, solution types, baking specifications, characterization techniques, and results will be presented.

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