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Engineering and characterization of high surface area graphitic carbon nitrides for hydrogen sorption DAVID STALLA, FLORIAN SEYDEL, ANDREW GILLESPIE, THOMAS LAM, MARK SWEANY, MARK LEE, PETER PFEIFER, University of Missouri, Columbia — Theoretical calculations predict graphitic carbon nitride to produce a binding energy to hydrogen (6.4 kJ/mol) which is greater than that of pure graphene, making it attractive as a storage medium. However, the prohibitively small surface areas characteristic of g-CN materials dramatically limit H2 uptake. We discuss efforts to increase surface areas through physical/chemical exfoliation and templating. N2 sorption directly determines improvements to surface area, EF/TEM maps the thickness of aggregated planes, powder XRD indicates a novel, 2-phase structure, and XPS quantifies in-plane chemistry largely independent of the literature, which fails in a consensus regarding binding energy assignments.

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