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Graphene Oxide Frameworks for Carbon Capture Applications JACOB BURRESS, ELIZABETH BAKER, DONALD BETHEA, KATHERINE FRANGOS, University of South Alabama — Growing concerns about anthropogenic global warming have concentrated scientific efforts on the reduction of greenhouse gases. The reduction of a significant greenhouse gas, carbon dioxide (CO2), is paramount. Physical sorbents possess many benefits over alternative storage and capture methods, including reusability. This project investigates nanoporous, physical sorbent materials for the separation of carbon dioxide. Van der Waals adsorption of gases is exploited in the use of nanoporous (pore width ca. 1 nm) materials for the storage and separation of gases. The material presented is a relatively new class of materials called graphene oxide frameworks (GOFs). GOFs consist of layers of graphene kept separated by organic linkers, in this case boronic acids. These materials are of interest because of the customizability of the pore width and chemistry through the careful selection of a wide variety of linkers. Results on the carbon dioxide separation in these materials will be presented. Additionally, results from chemical and structural analysis of these materials will be shown. These materials exhibit pore breathing, e.g. pore geometry expansion with increased pressure. Analysis of this behavior will also be presented.

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