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Synthesis and analysis of activated carbon briquettes as an adsorbent for natural gas

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Activated carbon has been used for many years for its adsorptive properties. These adsorptive properties are a result of its high surface area to density ratio. It achieves this through its activation process. During activation a network of pores forms throughout the carbon matrix. These pores give the carbon a very large surface area for outside molecules to adsorb to. By maximizing the distribution of different pore widths one can tailor the carbon to adsorb molecules of differing sizes and during various conditions. Our goal is to develop a natural gas (95% methane) fuel tank that uses corncob produced activated carbon as an adsorptive medium. To do this we need to maximize the distribution of pore diameters that are between 1~2 nanometers (10~20 Angstroms). We are currently studying different activation methods and their effect on the carbon's adsorptive properties. We have obtained volumetric nitrogen and methane isotherms, gravimetric methane analysis data, both scanning and tunneling electron micrographs, and small-angle x-ray analysis data obtained from Argonne National Labs. From this data we have begun producing activated carbon briquettes that will form the "core" of our tank. We hope to expand the use of these briquettes to not only automotive fuel tanks but to natural gas trapping and storage as well.