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Nanoporous biocarbon as a storage system for methane

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Activated carbon produced from waste corn cobs have recently been developed as an efficient and economical form of gas storage. With rising gas prices and concerns of global warming, natural gas has been brought to attention as an alternative to gas and diesel. Activated carbons are capable of storing natural gas at low pressures and safe lengths of time via gas adsorption. Van der Waals interactions between methane gas molecules and the carbon solid forces the methane into a supercritical fluid that adsorbs onto surface of the solid. Methane uptake is assessed gravimetrically with steel sample cells. Masses are calibrated to correct for the effects due to air buoyancy. Data collected through methane isotherms, techniques of solid state NMR, and small-angle scattering reveal the pore structures and distribution of various carbon samples. The optimal pore size can be determined by executing methane isotherms at varying pressures between 25 and 500 psi. Ultimately, the same advances will be performed with hydrogen gas in exploring solutions and improvements to the gas crisis.