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Elastic Pore Structure in Activated Carbon M.J. CONNOLLY, CARLOS WEXLER, University of Missouri Physics Department, THE ALLIANCE FOR COLLABORATIVE RESEARCH IN ALTERNATIVE FUEL TECHNOLOGY (ALL-CRAFT) COLLABORATION — Adsorbent materials such as activated carbon and Metal-Organic Frameworks (MOFs) have received significant attention as a potential storage material for hydrogen and natural gas. Typically the adsorbent material is assumed to consist of rigid slit- or cylindrical-shaped pores. Recent work, for MOFs in particular, revealed the importance of the mechanical response of the adsorbent in the presence of an adsorbate. In the absence of an adsorbate the pore structure is defined by the size, shape and inter-molecular interactions of the constituent parts of the solid. Here, we demonstrate the flexibility of pore walls in activated carbon and the effect this has on the pore structure of the bulk samples. The interaction is modeled as a competition between Van der Waals interactions between neighboring walls and a resistance to bending due to the rigidity of graphene. Minimal energy configurations were calculated analytically for a simplified potential and numerically for a more realistic potential. The pore structures are discussed in the context of pore measurements on activated carbon samples.

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