

Abstract Submitted
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Study of Xenon Adsorption on Zeolitic Imidazolate Framework – 8 (ZIF-8) DINUKA GALLABA, BRICE RUSSELL, ALDO MIGONE, Department of Physics, Southern Illinois University, Carbondale IL 62901 — We have investigated Xe adsorption on ZIF-8 for temperatures in the range between 138 and 158 K. ZIF-8 is known to undergo a structural (“gate-opening”) transition as a function of increasing pressure (or loading) for a number of adsorbates (N_2 , Ar, CO, O_2). For isotherms measured at sufficiently low temperatures, the gate-opening transition manifests itself as an additional (higher pressure) substep in the adsorption isotherm data. Xe isotherms measured above 145 K do not show the additional isotherm feature, while those measured below do. The extra adsorption step is a consequence of the “gate opening” transition that occurs due to the re-orientation of the organic linkers in the ZIF-8. This re-orientation increases the size of the apertures in the ZIF-8 structure, and consequently allows more Xe atoms to adsorb in the material, thus producing the additional adsorption step. The adsorption isotherm data were used to determine the effective surface area of ZIF -8 through application of the “point B” method. The isosteric heat of adsorption of Xe on ZIF -8 was determined from the isotherm data. We will also report on the kinetics of adsorption of Xe on ZIF-8.

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