

Abstract Submitted  
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**From  $^3\text{He}$  to Xe: adsorption isotherms on the same batch of BuckyPearls<sup>TM</sup> carbon nanotube bundles**<sup>1</sup> OSCAR VILCHES, EVAN MATTSON, KRISTINE KIM, DAVID COBDEN, University of Washington — We report a study of the adsorption of  $^3\text{He}$ ,  $^4\text{He}$ ,  $\text{H}_2$ ,  $\text{HD}$ ,  $\text{D}_2$ ,  $\text{Ne}$ ,  $\text{Ar}$ ,  $\text{N}_2$ ,  $\text{Kr}$  and  $\text{Xe}$  adsorbed on samples of BuckyPearls<sup>TM</sup>, a form of HiPCo-type<sup>TM</sup> carbon nanotube bundles, from the same batch used for neutron diffraction studies of the structure of  $^4\text{He}$  and  $\text{Ne}$  at low temperatures. For each gas, except  $^3\text{He}$  and  $^4\text{He}$ , we have measured three or more isotherms in a range of temperatures where we can observe the completion of both the three-line phase and the first layer. We can correlate the helium and hydrogen isotopes data and the  $\text{Ne}$  data with previous neutron and/or heat capacity measurements on BuckyPearls and HiPCo bundles. By taking ratios of monolayer completion coverage for the various gases to the  $\text{N}_2$  monolayer completion coverage we can compare nanotube adsorption to adsorption on exfoliated graphite. Quantum effects on adsorption can be seen by comparing areas per atom or molecule to Lennard-Jones hard core radii.

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