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Properties of adsorbed hydrogen films in nanospaces ELMAR DOHNKE, ANDREW GILLESPIE, PETER PFEIFER, University of Missouri Columbia — Various high surface area materials were evaluated for their gas storage properties. From supercritical hydrogen isotherms at 77 Kelvin, we estimated the adsorbed film densities, film thicknesses and intrapore gas densities. Intrapore gas density is a measurement of the average hydrogen density within a pore. Furthermore, we investigated the correlation between the isosteric heat of adsorption, surface chemistry, and pore size distribution with an adsorbed film. In most of the samples both saturated film densities and intrapore gas densites exceed the liquid hydrogen density at 1 bar and 20 Kelvin. The saturated film density surpassed it even by 40%. The adsorbed film seems to be independent of the isosteric heat of adsorption or the samples pore size distribution. They behave like a universal constant for all carbon-based surfaces.

Elmar Dohnke
University of Missouri Columbia

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