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Volumetric Analyses of Sieverts Apparatus Data ANNE DAILLY, CHANNING AHN, Caltech, JOHN VAJO, HRL Laboratories, ROBERT BOWMAN, JR., Jet Propulsion Laboratory — Sieverts measurements of volumetric excess physisorption adsorption/desorption data at temperatures other than ambient require assumptions related to temperature gradients within the system. In addition, assumptions related to the sample volume need to be considered if this data is not available *a priori*. We consider two approaches to Sieverts analysis for data obtained at 77K. In the first approach, we assume that we have three distinct volumes that consist of the reactor, the manifold, and a transition volume between the manifold and the reactor. In this case, the reactor temperature and the manifold temperature are known and measured with thermocouples. The transition volume temperature is assumed to be at a value half way between that of the reactor and the manifold. In the second approach, we make no assumptions about the transition volume temperature, but use a known blank volume within the reactor to produce an “instrument response” for an assumed sample volume. This data is normalized for the actual volume and used to generate an isotherm. The results of these analyses show that the two approaches yield almost identical isotherm results for hydrogen sorption in a high surface area activated carbon. We will also present data from metal-organic framework (MOF-5 or IRMOF-1) and alkali metal modified MOF structures.

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