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Capillary Condensation Pathways of CO2 under Templated Mesoporous Silica Confinement BO WANG, PAUL SOKOL, Indiana University — Adsorption of CO2 in porous medium has been of great current interest due to its potential for mitigating the global warming caused by greenhouse gases. In particular, the behavior of confined CO2 in mesoporous media near room temperature is particularly relevant to sequestration efforts. Realistic mesoporous systems, such as shales and coals, represent a complex fractal pore structure that complicates the interpretation of adsorption studies. We present the results of a study focused on the adsorption of CO2 in model mesoporous media with well-defined pore structures. Templated porous glasses, such as MCM-41 which has a regular network of 1D pores, provide an ideal system for fundamental studies of the adsorption process. In this study, we focus on the structure of adsorbed CO2 films which evolves in a mixture of phases and the development of nucleation occurs during the formation of high density liquid CO2 inside the confining matrix. We have used Small Angle Neutron Scattering to study the spatial distribution of material radially and transversely within the pores. The 30m SANS NG7 at NIST was used to map out the details of CO2 condensation pathway under mesoporous silica confinement.

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