

Abstract Submitted
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Enhanced Methanol Diffusion in Homogeneous Isotropic and Anisotropic Silica Aerogels¹ JEONGSEOP A. LEE, YIZHOU XIN, A.M. ZIMMERMAN, Northwestern University, Evanston, IL 60208, YANG SHEN, Tongji University, Shanghai, China, 200092, WILLIAM HALPERIN, Northwestern University, Evanston, IL 60208 — It has recently been shown that the ballistic mean free path of silica aerogels can be directly measured by measuring diffusion of adsorbed fluids that are in fast exchange with vapor state using nuclear magnetic resonance [1-2]. With this technique we have studied the effect of compression on the mean free path of radially shrunken and isotropic silica aerogels with 98% porosity. We have found unusual behaviors of pore geometry as a function of compression. Our preliminary findings suggest that the average pore geometry and the corresponding anisotropy thereof do not follow classical stress-strain relations suggesting more complex mechanism is at play.

[1] Jeongseop A. Lee, et al., Phys Rev. B 90, 174501 (2014).

[2] F. D’Orazio, et al., Phys. Rev. Lett. 63, 43 (1989).

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