



Contribution ID: 61

Type: Oral Presentation

Elasticity of Liquid Nitrogen in Nanoporous Vycor Glass

Tuesday, 31 May 2022 16:30 (15 minutes)

Experimental and theoretical research has shown that several factors influence the elastic properties of fluids confined in nanopores [1,2]. Previous experimental studies on the longitudinal modulus of confined fluids were mostly limited to the adsorbate argon. Here we study the longitudinal modulus of liquid nitrogen in the nanopores of Vycor glass at various temperatures using ultrasonic measurements. With the aid of an effective medium analysis we determine the modulus of the confined nitrogen, $\beta_{N_2,ads}$, from the measured effective longitudinal modulus of the system consisting of porous matrix and filled nanopores. In addition to the temperature dependence of the modulus at saturation vapor pressure, we investigate the impact of nanoconfinement on the pressure dependence of $\beta_{N_2,ads}$.

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Country

Germany

References

- [1] Christopher D. Dobrzanski, Boris Gurevich, and Gennady Y. Gor, Elastic properties of confined fluids from molecular modeling to ultrasonic experiments on porous solids, *Appl. Phys. Rev.* 8, 021317 (2021).
- [2] Klaus Schappert and Rolf Pelster, Elasticity and Phase Behavior of Fluids in Nanoporous Media, pp. 259-304 in *Soft Matter and Biomaterials on the Nanoscale*, Vol. 1, Patrick Huber (Ed.), World Scientific (2020).

Time Block Preference

Time Block B (14:00-17:00 CET)

Participation

Online

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