

Impact of salt on sorption isotherms in nanoporous media

Wednesday, 30 June 2021 16:30 (1h 30m)

Salt water is ubiquitous in nature (e.g. geomaterials, soil, clouds formation) and in technology (e.g. desalination, concrete weathering, heritage conservation). In most of these situations, salt water is confined within a porous medium, often with pores down to the nanometer scale: for example, crystallization and dissolution cycles induced by humidity changes are known to induce structural damage to building materials, artwork, etc. And yet, these processes are not well characterized, especially when pores are in the nanometer range. Here, we investigate the response of the salt water confined in several porous silicon samples (average pore diameter from 3 nm to 20 nm) to humidity cycles. We performed sorption isotherms where we monitored optically water content in the porous medium. We systematically characterized how the salt concentration impacts the shape of the isotherms and compared these results to a minimal model coupling solution thermodynamics to capillarity, nucleation and confinement effects.

Primary author: BELLEZZA, Hugo (Université Lyon 1-CNRS, Université de Lyon 69622 Villeurbanne, France)

Presenter: BELLEZZA, Hugo (Université Lyon 1-CNRS, Université de Lyon 69622 Villeurbanne, France)

Session Classification: Poster Session