Contribution ID: **411** Type: **Oral Presentation**

Electrochemical Actuation in Nanoporous Silicon

Wednesday, 1 June 2022 16:00 (15 minutes)

Porous silicon provides a scaffold structure to study the confinement related effects of soft matter. We investigate the electro-sorption of electrolyte anions and the electrochemical behaviour of nanoporous silicon in acidic electrolytes. The silicon-electrolyte interface acts as a capacitor which allows the accumulation of electrolyte anions in a chemical double layer by an applied voltage, whose characteristics can be measured by cyclic voltammetry. The surface stresses that are caused to the monolithic porous silicon membrane by such an accumulation lead to a macroscopic strain which can be determined in-situ with a laser beam-bending setup. Comparing nanoporous silicon with a planar silicon surface yields insights on the observed electrocapillarity - in particular with respect to the importance of oxide formation and wall roughness on the single-nanopore scale.[1]

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References

[1] Brinker, M., & Huber, P. (2021). Wafer-Scale Electroactive Nanoporous Silicon: Large and Fully Reversible Electrochemo-Mechanical Actuation in Aqueous Electrolytes. Advanced Materials, 2105923.

Time Block Preference

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

Participation

Online

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