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## Transport properties of H<sub>2</sub> confined in carbide-derived carbons with different pore shapes and sizes

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Carbide-derived carbons (CDC) are porous carbon materials with widely different properties like pore size distribution or graphitization [1]. In this study, quasi-elastic neutron scattering method was used to investigate the hydrogen diffusion in the well-defined pores of three distinct CDC materials [2]. Namely, the predominant shape of pores of the studied CDCs had been shown to be different as well as the respective pore size distributions [2]. Two of the studied materials were mostly microporous, while the third mostly mesoporous. Using a combined approach of gas adsorption methods and in-situ quasi-elastic neutron scattering, some interesting insights were gained on the relation of local adsorbent structure and the molecular behaviour of confined hydrogen. It was shown that sub-nanometer pores of spherical and cylindrical shape strongly limit the diffusion of H<sub>2</sub>. However, a much weaker adsorption was seen in mainly mesoporous CDC, resulting in higher H<sub>2</sub> mobility in that adsorbent. This demonstrates, that tailoring the pore structure of carbon materials can have a large effect on their H<sub>2</sub> storage capability.

Refs.

- [1] Härmas, R.; Palm, R. et al. Carbon 2019, 155, 122–128, doi:10.1016/j.carbon.2019.08.041.
- [2] Härmas, R.; Palm, R.; et al. C 2021, 7, 29, doi:10.3390/c7010029.
- [3] Kurig, H.; Russina, et al. Carbon 2016, 100, 617–624, doi:10.1016/j.carbon.2016.01.061.

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