

Characterization and adsorption-based applications of nanoporous materials

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The workshop program will focus on adsorption measurement techniques and methodologies for the assessment of adsorption properties and textural/structural characterization of novel nanoporous materials including zeolites, carbons, MOFs as well as materials consisting of hierarchically structured pore networks. A major point will be the correlation of textural properties, adsorption behavior, catalytic reaction pathways as well as transport properties with applications in gas and energy storage, separations and catalysis. Within this framework, the workshop will offer a platform for scientific discussions and for a knowledge transfer between various scientific areas where diffusion and transport properties of porous materials are of importance.

The workshop will include an in-depth discussion of gravimetric and manometric adsorption techniques and their application areas. Within this context, we will provide a general view of state-of-the-art gravimetric sorption analysis using magnetic-suspension balances (MSB). The implications of density determination with equations of state and the MSB will be discussed, which will finally lead to a practical approach on how to reliably determine measurement uncertainties. Another main topic is the application of manometric adsorption techniques coupled with advanced theoretical and molecular simulation-based methods for a reliable textural characterization of nanoporous materials. We will also highlight adsorption-based applications of porous materials correlated with structure-property relationships for applications in gas separation and storage.