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The Open-Access Journal for the Basic Principles of Diffusion Theory, Experiment and Application

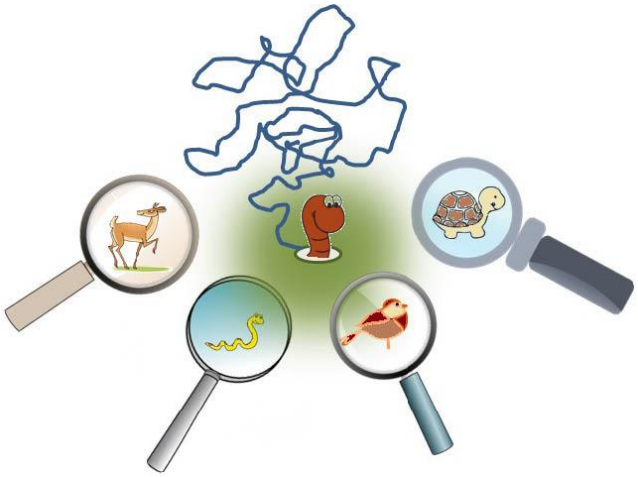
Diffusion in Nanoporous Materials,

an IUPAC (International Union of Pure and Applied Chemistry) Initiative, dedicated to elaborate

Guidelines for the measurement and reporting of diffusion properties of chemical compounds in nanoporous materials serving for catalytic, mass separation, and other relevant purposes.

In many applications of nanoporous materials, including mass separation and conversion, CO_2 capture, atmospheric water harvesting, and adsorption cooling, mass transport plays a key role. After the introduction of PFG NMR has led to a paradigm shift in our understanding decades ago, determining the rate-limiting steps of molecular diffusion in nanoporous materials has remained a challenging task. The preparation of a Technical Report with the guidelines for the measurement and reporting of diffusivities is currently the focus of an IUPAC task group[1-3]. The workshop is thought to serve as a final step towards its finalization by ensuring direct contact between representatives of the different techniques of measurement and a broad audience of potential users. After, in the regular program, the various ranges of mass transfer of relevance for diffusion in such materials and the challenges of their measurement are covered in a series of (short) plenary talks, the workshop is thought to serve as a refinement of the toolbox for measurement and a discussion of the Technical Report in its as-is form. A draft of the Technical Report shall be distributed among the participants. Presentations during the Plenary Program and the Workshop are scheduled to be given by

Stefano Brandani, University of Edinburgh
Jürgen Caro, Hannover University
Dieter Freude, Leipzig University
Jörg Kärger, Leipzig University
Bill Price, University Western Sydney
German Sastre, Valencia University
Randy Snurr, Northwestern University



Scientists have been puzzled by the observation of dramatic differences in the diffusion rates in micro-porous solids probed by different experimental techniques, approaching, in some cases, several orders of magnitude. This situation is exemplified in the accompanying cartoon[3] showing that, from the perspective of different observers using different experimental tools, the rate of a chaotic underwater excursion by the Loch Ness Monster may appear to approach the rates of an antelope run, snake creep, bird fly, or turtle crawl.

[1] J. Kärger, D.M. Ruthven, R. Valiullin (Eds.), Diffusion in Nanoporous Solids, Thematic Issue of the Adsorption Journal **27**, nos. 3 and 5, 2021.

[2] J. Kärger, D.M. Ruthven, and R. Valiullin, , *Chemistry International* **43** (2021) 25–29.

[3] R. Valiullin, Can Random Motion Look the Same from Different Perspectives? *Chemistry International* **38** (2016).