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Editorial

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Editorial

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Pure and multicomponent gas adsorption equilibria, kinetics and heats are three key input variables for design and optimization of adsorptive gas separation processes. Accurate measurements of these properties are required for acceptable process design by the industry. Several new experimental techniques for measuring these properties have been developed during the last decade. One session of the 1997 annual American Institute of Chemical Engineers meeting, sponsored by the Separations Division—Adsorption and Ion-Exchange group, was devoted to discussions of some of these techniques. This special edition of *Adsorption* compiles five previously unpublished papers which were presented in that meeting. They describe cutting edge experimental methods as well as new data and their interpretations. Each paper passed through the standard peer review process set by the Journal, and we as editors arranged the reviews for our own papers.

The first paper by Stallmach and Kärger of University of Leipzig, Germany reviews the methodology and applications of Pulsed Field Gradient NMR technology for measurement of self-diffusion of fluid molecules within porous substrates ranging between zeolites and sedimentary rocks. All aspects of this fascinating subject are discussed.

The second paper by Grenier, Malka and Bourdin of CNRS, France describes a Frequency Response Method based on infrared measurement of adsorbent surface temperature for gas adsorption kinetic study. It is particularly suitable for evaluating very fast kinetics.

The third paper by Mohr, Vorkapic, Rao and Sircar of Air Products and Chemicals, Inc., USA describes an Isotope Exchange Technique for simultaneous measurement of pure and multicomponent gas adsorption equilibria and kinetics on porous adsorbents. The experiments are conducted isothermally without disturbing the adsorbed phase. The methane-nitrogen-4A zeolite system is studied.

The fourth paper by Staudt, Rave and Keller of University of Siegen, Germany reports simultaneous evaluation of pure gas adsorption kinetics and equilibria by using a microbalance and by measuring the capacitance of the gas-solid adsorption system. The capacitance measurement exhibits some peculiar behavior for the H_2S-13X system.

The fifth paper by Siperstein, Gorte and Myers of University of Pennsylvania, USA reports calorimetrically measured pure and binary gas isosteric heats of adsorption for ethane-ethylene-NaX zeolite system. The pure and binary gas adsorption equlibria are also measured. A thermodynamic analysis of the data is given.

It is refreshing to note that efforts are still being made around the world to gather and understand pure and multicomponent adsorption data (equilibria, kinetics and heats) which form the heart of adsorption process designs. The lack of good multicomponent data in the published literature is well known. Unfortunately, a significant portion of current research in this area is simulation based when good experimental data are very much needed.

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