Special Issue

Design of Heterogeneous Catalysts and Adsorbents

Message from the Guest Editors

Heterogeneous catalysts and adsorbents are tailor-made materials with many common requirements. Typically, they consist of porous structures to accommodate the highest possible surface area for adsorption and/or (electro-)catalytic transformation. Obviously, a high surface area corresponds to small particles and pore sizes, resulting in diffusion limitations with an often strongly negative influence on the effective catalytic activity, product selectivity, or dynamics of sorption processes. In addition to the inner structure of heterogeneous catalysts and adsorbents, their outer shape also plays an important role in their overall performance. Since the external geometry is relevant for reactor-specific aspects, such as pressure drop as well as external mass and heat transfer properties, it becomes evident that the design of heterogeneous catalysts and adsorbents is a challenging task requiring deep understanding of the occurring processes on multiple scales.

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