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# Sorption of SF6 and SO2 on Modified Zeolites Materials

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Information about the porous nature of adsorbents is important for understanding the pore structure of solids. Adsorption is widely used as a probe for pore structure. The measured adsorption behavior of a sample reflects, in an aggregated manner, the adsorption behavior of individual pores. Sulfur hexafluoride (SF6) and SO2 are industrial gases used in various applications. Compared to CO2, they are among the most common gases whose presence is harmful in the atmosphere. Their conventional capture methods are costly due to the energy required for phase transitions. These two gases differ not only in their chemical nature but also in their structure, size, and shape, factors that significantly affect transport and adsorption capacity.
In this study, the sorption of SF6 and SO2 was investigated on several selected inorganic materials. Experimental studies of sorption isotherms at 298K showed that, for both sorbates, higher sorption values were obtained for SO2 over the entire pressure range. Tests were conducted on samples belonging to two material topologies: faujasite (FAU) and MFI-type frameworks, whose structures differ in pore size and connectivity. This paper presents experimental data and proposes a mathematical description of the sorption process. These materials behave like molecular sieves and can be used for quite selective adsorption of the relevant gases. Furthermore, modification of the faujasite with organic silane resulted in a drastic reduction of the sorbent's surface area, leading to significantly lower sorption capacities for gases. This research is important not only for practical applications but also for modeling and predicting sorption processes, considering not only the effects of molecular sieves but also the influence of surface nature and interactions with polar and non-polar molecules.

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