

Adsorption of volatile organic compounds over MIL-125-NH₂

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Volatile organic compounds (VOCs) cause environmental and health problems by forming photochemistry smog, and development of an effective adsorbent for their removal is important. In this work, adsorption of a series of selected VOCs over an amine-functionalized metal organic framework, MIL-125-NH₂, was investigated by measuring their adsorption isotherms at three different temperatures. Significant amounts of the VOCs were adsorbed, and their adsorption capacities increased with the increasing order of polarity (p-xylene < toluene < benzene < acetone < isopropanol). In addition, formaldehyde breakthrough capacities were measured and MIL-125-NH₂, exhibited a clearly superior performance to other MOFs, probably because of the synergistic effects provided by the amine groups that strongly interacting with the formaldehyde and the small micropores in MIL-125-NH₂.