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Gas separation using novel materials: kinetics of gas adsorption on RPM-1 and Cu-BTC metal-organic frameworks KATHLEEN LASK, VAIVA KRUNGLEVICIUTE, ALDO MIGONE, Department of Physics, Southern Illinois University Carbondale, J.-Y. LEE, JING LI, Department of Chemistry and Chemical Biology, Rutgers University — We have measured the adsorption kinetics of two gases, freon and argon, on two microporous metal-organic framework materials, RPM-1 (or $[Co_3(bpdc)_3bpy]\cdot 4DMF\cdot H_2O$, bpdc = biphenyldicarboxylate) and Cu-BTC (or $[Cu_3(btc)_2(H_2O)_3]$, btc = benzenetricarboxylate). The measurements were conducted at comparable values of the scaled temperatures ($T_{isotherm}/T_{critical}$) for the respective gases. In our experiments, we monitor the pressure decrease as a function of time after a dose of gas is admitted into the experimental cell. The kinetics results obtained for both gases are similar on Cu-BTC, while they are significantly different in RPM-1. Our results indicate that RPM-1 has potential for gas separation for mixtures of species with dimensions similar to argon and freon; this is not the case for Cu-BTC MOF.

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