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不同分子筛的氮氩分离性能

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摘要 采用水溶液离子交换法制备了不同离子交换的13X和4A分子筛，并在25℃下测定了它们的静态吸附等温线和动态穿透曲线。研究发现，Ca~(2+)离子和Li~+离子 交换的13X和4A分子筛对氮的吸附性能都明显优于其相应的钠型分子筛，而它们对 氩的吸附量变化不大，说明这两种离子交换的分子筛是较好的氮氩分离吸附剂。从 动态吸附的结果来看，所研究的各种分子筛都有一个最优的吸附分离压力，在本论 文研究的压力范围内，这个最优压力在0.6MPa附近。通过穿透曲线推算出的混合气 体吸附量和纯气体吸附量的对比可以得出，对于氮氩吸附选择性较高的分子筛，氮 的存在对氩的吸附量有较大的影响。

关键词 分子筛 吸附 氮 氩 分离

分类号 06

Adsorptive Separation of N_2 and Ar by Different Zeolites

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Abstract The zeolites 13X and 4A were ion exchanged with different ions in water solution, then the adsorption isotherms and breakthrough curves of these zeolites were measured at 25 ℃. The data demonstrate that the zeolites 13X and 4A ion-exchanged with Ca~(2+) and Li~+ have higher adsorption capacity of N_2 than the original ones, but the Ar adsorption capacity of these ion exchanged zeolites is almost the same as that of the original ones. It is clear that these ion-exchanged zeolites have better adsorption selectivity for N_2 than for Ar. From breakthrough curves it is known that the zeolites have a suitable pressure for adsorption separation of N_2 and Ar. In the pressure range we studied, the best pressure is about 0.6 MPa. The adsorption capacities for N_2 and Ar in the gas mixture can be obtained from the breakthrough curves. Compared with the adsorption capacity for pure N_2 and Ar, It can be found that N_2 in the mixture has a large effect on the Ar adsorption capacity of the zeolites which have higher adsorption separation selectivity for N_2 and Ar.

Key words MOLECULAR SIEVE ADSORPTION NITROGEN ARGON ISOLATION

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