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Sorption of carbon dioxide on binderless beads of 13X zeolite

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Abstract

The sorption equilibrium of CO₂ and CH₄ in binderless beads of 13X zeolite has been investigated between 313 and 373 K and pressure up to 4 atm. The amount adsorbed of CO₂ and CH₄ is around 5.2 mmol/gads and 1.2 mmol/gads, respectively, at 313 K and 4 atm. Comparing these values with the ones in literature the value of CO₂ is 20% higher than in CECA 13X binder pellets. The crystal diffusivity of CO₂ measured experimentally by the ZLC technique is 5.8×10^{-15} m²/s and 1.3×10^{-15} m²/s at 373 and 313 K, respectively. These values are in the same order magnitude of the ones measured by a frequency response and pulse chromatography techniques reported in literature. The ZLC desorption curves for CH₄ were measured under an equilibrium regime and no kinetic data is obtained.

Author Keywords

Adsorption equilibrium; Binderless 13X zeolite; Sorption of CO₂/CH₄; ZLC technique

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