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ÁREA: Síntese e caracterização de catalisadores e adsorventes

Study of the synthesis of pillarized lamellar materials for CO2 adsorption.

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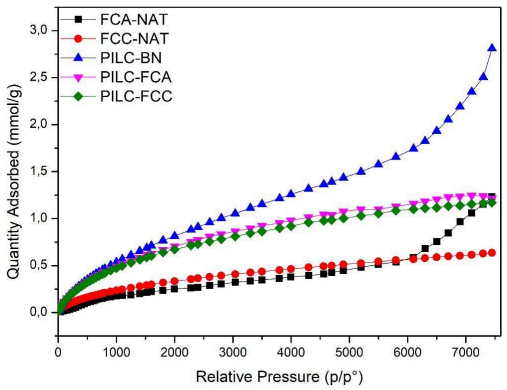
Resumo-Abstract

The present work presents the synthesis and characterization of commercial and natural pillared clays, exploring their application in CO2 capture.The study methodology consisted of the Keggin ion synthesis, where the clay is interspersed through the dispersion of the pillaring agent, dried and subsequently calcined, obtaining pillarization. Sample characterizations involved X-ray diffraction (XRD), X-ray fluorescence (XRF), Fourier transform infrared spectroscopy (FTIR) and scanning electron microscopy (SEM). The XRD analysis showed displacements in the reflection peaks referring to the d001 plane, demonstrating success in the process of insertion of the pillaring agent for all samples, followed by the success in the pillarization process, taking example the BN sample, a commercial clay that presented a basal spacing initial 1.26 nm and went to a spacing of 1.85 nm. The material showed a variation in its surface area from 33 m²/g to 229 m²/g, proving the increase in its porosity. FTIR and XRF analysis confirmed the insertion of the pillars and the lamellar structure of the samples was observed through scanning electron microscopy, in addition to other characteristics obtained. The materials were applied for CO2 adsorption, where it was proven that pillared clays have a greater adsorption capacity than natural clays, with the most significant result being 2.72 mmol/g for the BN sample when subjected to higher pressures.



Keywords: clays, keggin ion, pillarization, montmorillonite, CO2 adsorption.

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