

عنوان مقاله:

Nitrogen doped porous carbon derived from nanofibrous polyaniline for CO₂ adsorption

محل انتشار:

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خلاصه مقاله:

The objective of this work is to develop a cost-effective carbonaceous CO₂ adsorbent. N-doped porous carbon (NDC) with nano-pore size was synthesized by KOH activation of nano polyaniline (PANI). PANI synthesized in this work has thin nanofibrillar morphology with different lengths and diameters. The activation process was carried out at 800 °C with KOH/precursor ratio of 2. This adsorbent of carbon exhibits high CO₂ adsorption capacity of 1.9 mmol/g at 25 °C under atmospheric pressure. The morphology of PNCs is investigated through different technical methods, such as scanning electron microscopy (SEM), N₂ adsorption isotherm at 77 K and Fourier transform infrared spectroscopy (FTIR). The CO₂ adsorption experiments were done at three different temperatures (298, 308, and 318 K) and pressures up to 10 bar, and correlated with the Langmuir, Freundlich, and Sips models. The Sips isotherm model presented the best fit to the experimental data. Small values of isosteric heat of adsorption were evaluated based on Clausius–Clapeyron equation showed the physical nature of adsorption mechanism. The high amount of CO₂ capture .by nano-pore size NDC renders it as a promising carrier for practical applications such as gas separation

کلمات کلیدی:

nano Polyaniline, Nitrogen doping, Carbon dioxide Adsorption, Chemical activation

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