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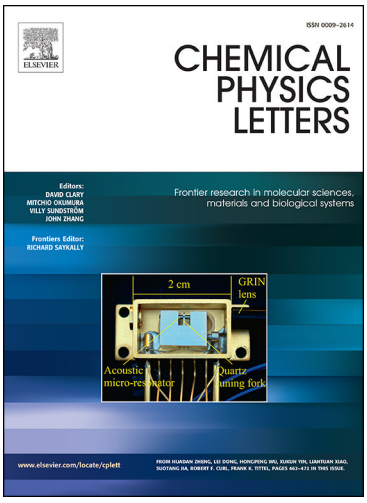

Research paper

Preparation of nitrogen doped carbon from tree leaves as efficient CO_2 adsorbent

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Preparation of nitrogen doped carbon from tree leaves as efficient CO_2 adsorbent

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Abstract

In this work, we reported the synthesis of nitrogen doped carbons from camphor tree leaves. The leaves were carbonized and then activated with KOH, and the nitrogen element in the leaves was used as the nitrogen source. The carbon showed a high surface area of 1736 m^2/g. A high CO_2 uptake of 5.86 mmol/g at 1 bar and 273 K was achieved by the carbon activated at 600 °C. The test results also revealed that for carbons with similar volume of small micropores, the one with a high nitrogen content tended to achieve better adsorption performances.

Keywords: Camphor leaves; Nitrogen doping; Porous carbons; CO_2 adsorption.

1. Introduction

CO_2 emission control has been considered to be a crucial necessity [1]. Aqueous amines are commonly used to adsorb CO_2 from the flue gas, but they are corrosive, toxic and not easy to regenerate [2]. Nanoporous materials can interact with CO_2 through physisorption, the process is fast and reversible, also the desorption demands much small energy consumption, creating an alternative and promising path for CO_2 capture.

The CO_2 adsorption behaviors of porous carbons depend on various features, for