**METAL-FREE ACTIVATED BORON NITRIDE: A HIGHLY EFFICENT ADSORBENT FOR CARBON CAPTURE**

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Limiting CO2 emissions into the atmosphere is one of the major climate change targets. Carbon capture and storage play an important role in the industry for achieving a significant reduction in atmospheric CO2 emissions. Carbon capture technologies are grouped as post-combustion, pre-combustion, and oxy-fuel combustion1. The continuous progress of adsorbent technology requires further development in material research and development and testing. Herein, we design and modify a novel class of sorbent materials known as porous boron nitride (BN) to efficiently capture CO2 as compared to conventional materials. Among the wide range of technologies, solid sorbents by post-combustion processes are regarded as being green and economic technologies2. This study aims to develop high-performance and low-cost adsorbents for carbon capture. More recently, literature has emerged that porous boron nitride is an ideal candidate for carbon capture and separation. However, the majority of these publications have led to a low CO2 sorption capacity3-4. To fill this gap, we have prepared boron nitride with high-affinity interaction with Lewis acidic CO2 considering several synthetic conditions in terms of modifying the charge state and the porosity of boron nitride5. Our study opens up a new route for the design and fabrication of well-controlled porous boron nitride structures which could be applied as an effective solid sorbent for CO2 capture.

Keywords:

Carbon capture, solid sorbent, boron nitride, porosity.

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