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Review

A review on the effect of amination pretreatment for the selective separation of CO_2

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HIGHLIGHTS

- A review of surface chemical characteristics of activated carbon (AC) is provided.
- The significance of enhanced surface energy through amination of AC is described.
- Pretreatment prior to amination is assessed to improve selective adsorption of CO_2.
- The efficiency of different adsorbents is assessed for CO_2 adsorption.
- KOH is found to be the most efficient pre-treatment for improving amination.

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ABSTRACT

For the cost-effective control of unregulated CO_2 emissions, its capture through modifications to adsorbents has recently gained much attention. In this respect, amination through basification of activated carbon (AC) surface is one of the practical approaches to separate CO_2. To learn more about such mechanism, a number of key variables (e.g., the nature of the AC surface groups, their CO_2 absorption enthalpy, and the effect of amination on adsorption) are reviewed. The potent role of amination is hence described with respect to the significance of pretreatment prior to amination technique by comparing the performance of diverse media (e.g., advanced oxidation processes (AOP), $Ca(NO_3)_2$, and KOH) for such application. The analysis of collected adsorption data suggests that the efficiency of amination and eventual selective adsorption of CO_2 can be improved by such pretreatment as KOH sintering in terms of inducing stronger surface CO_2 binding energy.

Contents

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