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碳基吸附剂对氢同位素的吸附行为研究(I)

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摘要 采用静态压差法研究了液氮温度下碳基吸附剂活性炭(AC)、碳分子筛(601)和碳纳米纤维(CNF)对氢同位素的吸附行为。实验结果表明:601对氢同位素的吸附量为最高、AC次之、CNF最小,并存在明显的同位素效应;吸附量的大小与吸附剂表面活性基团的数量有关;用浓HNO₃对碳基吸附剂进行改性处理,在吸附剂表面引入氧杂原子,可增大这类吸附剂对氢同位素的吸附量。

关键词 [氢同位素](#) [低温吸附](#) [碳基吸附剂](#) [表面改性](#)

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Cryogenic Adsorption of Hydrogen Isotopes on Carbonaceous Adsorbents (I)

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Abstract The static differential pressure method is used to study the cryogenic adsorption of hydrogen isotopes on the carbonaceous adsorbents, including activated carbon(AC), carbon molecular sieve(601) and carbon nano fibers(CNF). Experimental results indicate that the adsorption capacity of hydrogen isotopes on 601 is higher than that on AC or CNF at liquid nitrogen temperature and CNF has the smallest adsorption capacity. Isotopic effects of H₂ and D₂ adsorption on all these adsorbents are also observed. It is demonstrated that hydrogen gas adsorption capacity is numerically related to the surface active sites of carbonaceous adsorbents and concentrated HNO₃ can be used to carry out surface modification to increase the number of active sites.

Key words [hydrogen isotopes](#) [cryogenic adsorption](#) [carbonaceous adsorbents](#) [surface modification](#)

DOI

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