

Ammonia activated porous carbons derived from polysaccharides and their application for carbon capture

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Porous carbon materials have been prepared using polysaccharides including cellulose, chitosan and alginic acid as precursors by carbonization at high temperature under nitrogen atmosphere, followed by ammonia activation. The temperature of carbonization and activation significantly affect the pore structure and CO₂ adsorption capacities of porous carbon materials. The specific surface areas of pristine carbons of alginic acid were measured as high as 258.2 m²g⁻¹ with a pore volume of 0.15 cm³g⁻¹. After ammonia activation process, the surface areas were further increased up to 1032.0 m² g⁻¹ with a pore volume of 0.65 cm³g⁻¹. The CO₂ adsorption capacity of ammonia activated carbon also increased from 1.48 to 2.20 mmolg⁻¹.