Hierarchical Interconnected Nanoporous Carbon for Gas Adsorption and Energy Storage

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Porous carbons have become increasingly attractive materials for CO_2 adsorption and electrodes for supercapacitors owing to their large surface area, tolerance to harsh chemicals, the ability for controlled porous structure design, etc. However, optimization of pore characteristics for specific applications is crucial for the utilization of hierarchical porous carbon. By taking the advantage of molecular design flexibility of Benzoxazine chemistry, N-enriched porous carbon with controllable morphology has been tailored through the sol-gel process. The ultra-microporous nitrogen-enriched carbons for CO_2 and CH_4 adsorption were successfully prepared through the one-step carbonization of a polybenzoxazine precursor. For the application as the electrodes for supercapacitors, the relationships between the specific capacitance and pore parameters of the nanoporous carbon electrodes derived from polybenzoxazines using a facile, inexpensive, and eco-friendly approach to rationally design and synthesize nickel/nickel oxide nanoparticles-embedded porous carbon nanosheets with micro- and mesoporous structure have been investigated.

References:

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