

Adsorptive removal of CO₂ with amine-functionalized mesoporous silica materials prepared via anionic surfactant-mediated synthesis

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A series of directly amine-functionalized mesoporous silica was prepared via the anionic surfactant mediated synthesis method and applied to CO₂ adsorption at room temperature. Amine content in the mesoporous material, rather than surface area or pore volume of the silica support, was the most critical factor to achieve a high CO₂ adsorption capacity. Covalently bonded amine species in the mesoporous silica were robust enough to maintain virtually the same adsorption performance during a 10-repeated adsorption-desorption cycle.