

Spray Pyrolysis Synthesis and Characterization of Mesoporous SiO₂ for VOCs adsorption:
Effect of transition metal dopants

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Mesoporous silicas(SiO₂) have been widely used as adsorbents for VOCs adsorption. Because they have high surface area, high thermal and chemical stability. In this study, mesoporous SiO₂ particles were synthesized by spray pyrolysis combined with sol-gel process. The spray pyrolysis method has advantages of synthesizing spherical nano- or micron-sized particles in one-step process and controlling the morphology of the products. Also, mass production is possible with spray pyrolysis as it is a continuous reaction process. In order to control textural properties of the product particles, CTAB was added into the precursor solution as a template. Also, various transition metals (Zn, Co, Ni and Fe) were added into silica sol to investigate the effect of dopant metal species on VOCs adsorption capacity. The synthesized adsorbents were analyzed by BET, XRD, FE-SEM and Breakthrough experimental.