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Morphology control of CuO nanoparticles in SBA-15 by adjusting the depressurization rate of supercritical CO_2

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The morphology of the supported nanoparticles, which has been utilized widely in catalysis, biomedicine and stealth technology, is directly related to their property. As is well known, the adsorption effect is significant to control the nanoparticle distribution, nanoparticle morphology and metal loading for supercritical fluid deposition (SCFD). Here we extended this strategy to adjust the depressurization rate of supercritical CO_2 subsequent to adsorption equilibrium. We found that the CuO particle size distributions become narrower and monomodal with increasing the depressurization rate of supercritical CO_2 by TEM. Moreover, the trend was confirmed by TPR and XRD.