Supporting Information for

A Compressible Mesoporous SiO₂ Sponge Supported by Carbon Nanotube Network

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Figure S1.

Figure S2.

Figure S3.

Figure S4.

Figure S5.
Figure S1. Structure characterization and thermal stability of CNT@m-SiO₂ sponges under different m-SiO₂ coating thickness. Compressive stress-strain curves (a), TGA (b) and N₂ adsorption desorption isotherms (c) of CNT@m-SiO₂ sponges under m-SiO₂ thickness from 8 to 20 nm.

Figure S2. Compression behavior of CNT and CNT@m-SiO₂ sponges. (a) Loading and unloading compressive stress-strain curves of a CNT sponge at ε=50%. Curves of cycle 1, 100 and 750 are plotted. (b) Compressive stress-strain curves of a CNT@m-SiO₂ sponge at cycle 1, 100 and 750.
Figure S3. Tailoring morphology and thickness of the m-SiO$_2$ coating. (a-c) TEM images of CNT@m-SiO$_2$ sponges with different morphologies synthesized by different CTAB/CNTs weight ratios of (a) 30:1, (b) 10:1, (c) 2:1. (d-f) TEM images of CNT@m-SiO$_2$ sponges with different m-SiO$_2$ thicknesses synthesized by different TEOS amount of (d) 0.03 g, (e) 0.05 g and (f) 0.07 g.
Figure S4. Characterization of CNT and CNT@m-SiO₂ sponges, including (a) N₂ adsorption-desorption isotherms, (b) Raman spectra, (c) wide-angle XRD patterns, and (d) tensile testing curves of the two samples, respectively.

Figure S5. Dynamic adsorption setup. A bulk CNT@m-SiO₂ sponge (20 mg) was immersed in 10 mL MO solution in a dish placed on a stage in a mechanical testing instrument. The top stage was set to compress the sponge to \( \varepsilon = 50\% \) cyclically and fluid was pumped through the sponge constantly during the entire adsorption process.