

Supporting Information (SI)

Microgravimetric Analysis Method for Activation-Energy Extraction from Trace-Amount Molecule Adsorption

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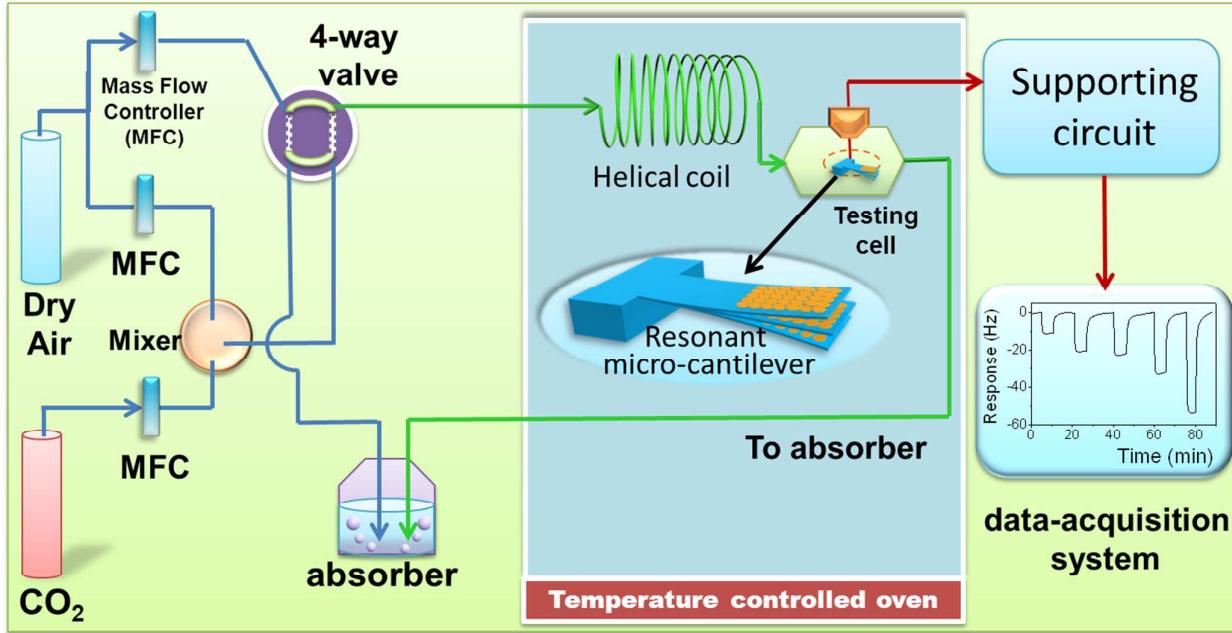


Figure S1. Schematic of the set-up for varying-temperature micro-gravimetric analysis experiment to CO₂ adsorption. Loaded with the adsorbing material sample, the resonant micro-cantilever is put into the testing cell for real-time detection of adsorbate mass.

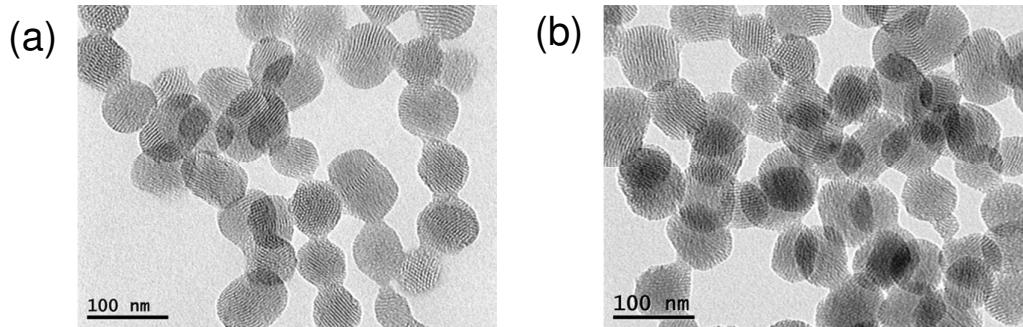


Figure S2. TEM images of the as-prepared two MSNs samples: (a) mono-amine functionalized MSNs; and (b) dual-amine functionalized MSNs.

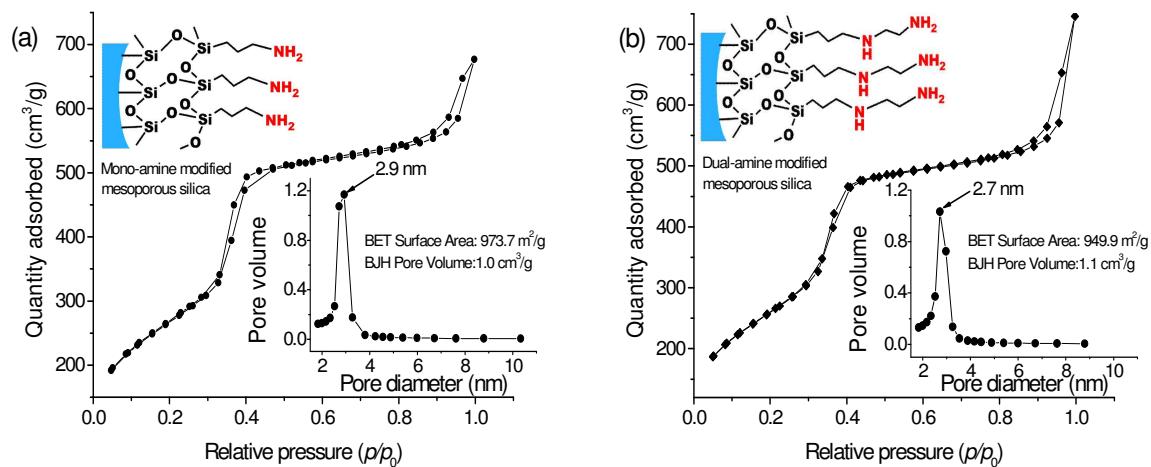


Figure S3. Nitrogen sorption isotherms of the two materials, with mono-amine modified MSNs in (a) and dual-amine modified MSNs in (b). The insets show the pore-size distributions and some structural parameters of the mesoporous-silica nano-particles.

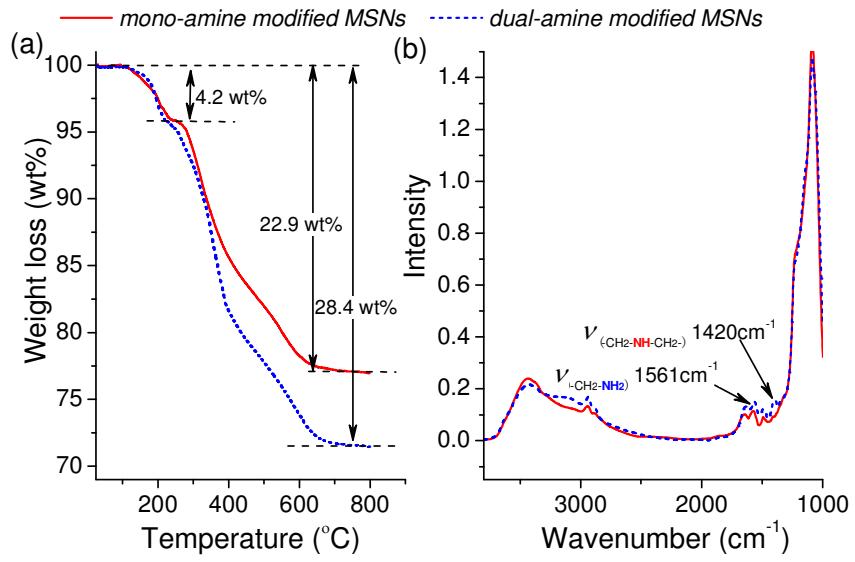


Figure S4. (a) TGA and (b) FT-IR spectra of the two CO₂ adsorbing nano-materials, with the results for mono-amine modified MSNs in red line and the dual-amine modified MSNs in blue dotted line.