Supplementary Information

User-friendly synthesis of nitrogen-containing polymer and microporous carbon spheres for efficient CO$_2$ capture

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Figure S1. SEM images of (a) PHMT-60, (b) PHMT-100 and (c) PHMT-130.
Figure S2. Nitrogen sorption isotherm and the corresponding pore size distribution curve of C-RF-800 obtained by carbonization of resorcinol-formaldehyde polymer at 800 °C.

Figure S3. CO₂ capture capacities of C-RF-800 at 0 °C and 25 °C (a) and isosteric heat of adsorption for CO₂ at different CO₂ loadings (b).

C-RF-800 shows a CO₂ capture capacity of 2.6 mmol/g, much lower than that of HMT-80-600 (3.3 mmol/g) and HMT-80-800 (3.6 mmol/g). Considering the similar microporous surface area of C-RF-800 and HMT-80-600, it can be conclude that the nitrogen-containing groups play an important role in CO₂ capture. The initial Qₛₐ for C-RF-800 was 26.5 kJ mol⁻¹, much lower than that of HMT-80-800 of 30.4 kJ mol⁻¹. The high Qₛₐ for HMT-80-800 is due to favorable interactions between adsorbed CO₂ molecules and the Lewis basic amine functionalities decorating the pores.