

Understanding the breathing phenomena in nano-ZIF-7 upon gas adsorption

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SUPPORTING INFORMATION

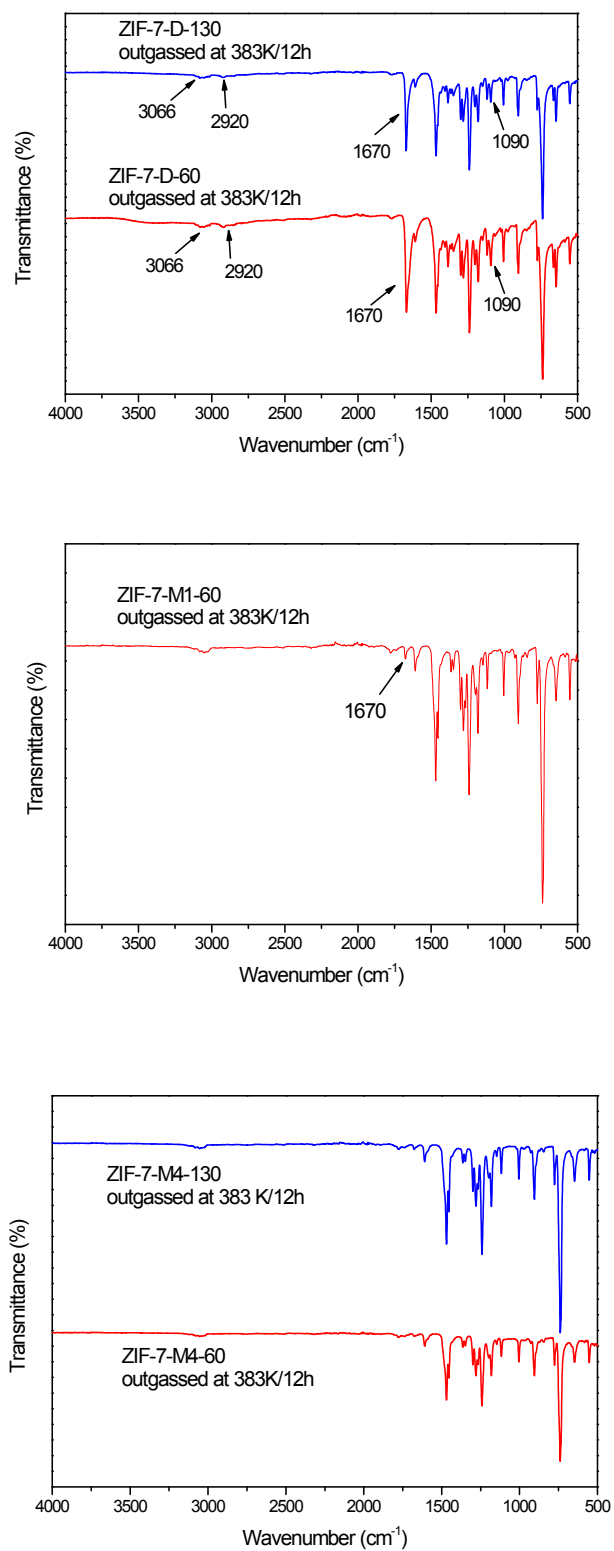


Figure S1. FTIR spectra for the different ZIF-7 samples after an outgassing treatment at 383K for 12h.

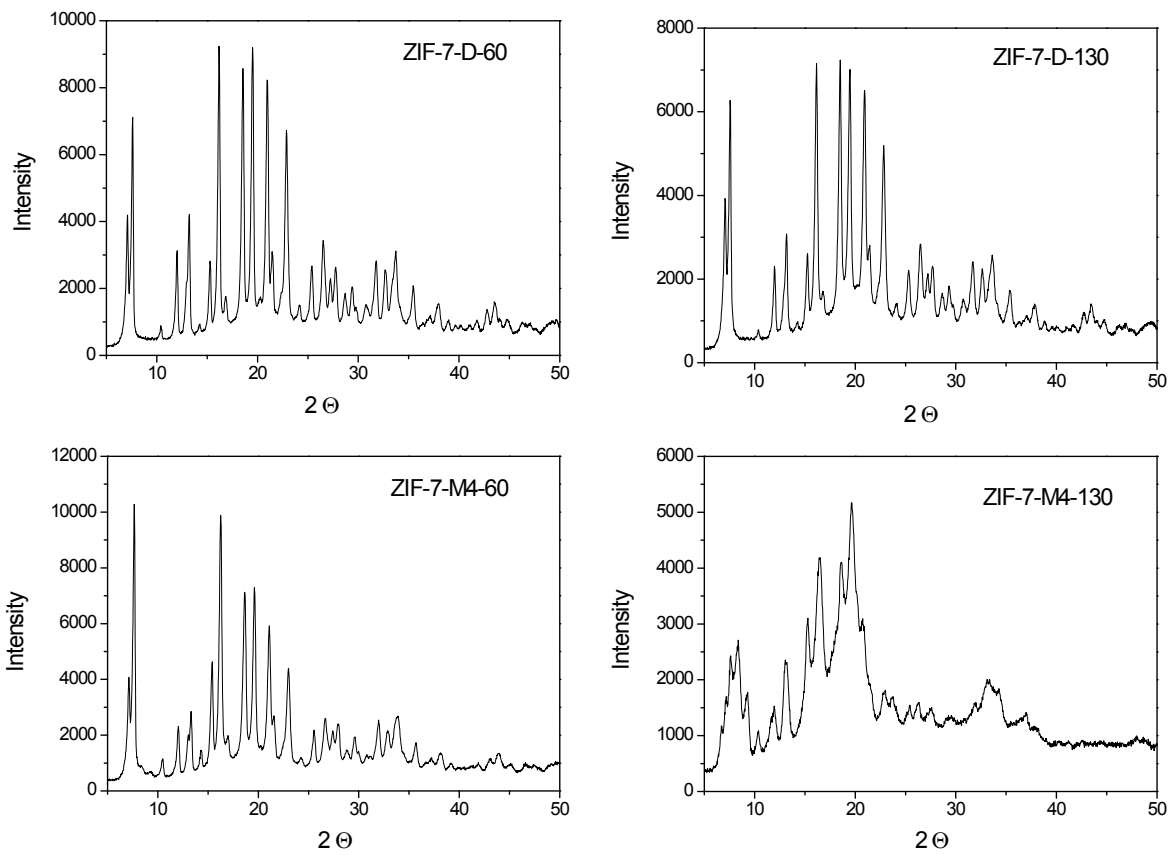


Figure S2. XRD pattern for the different ZIF-7 samples prepared.

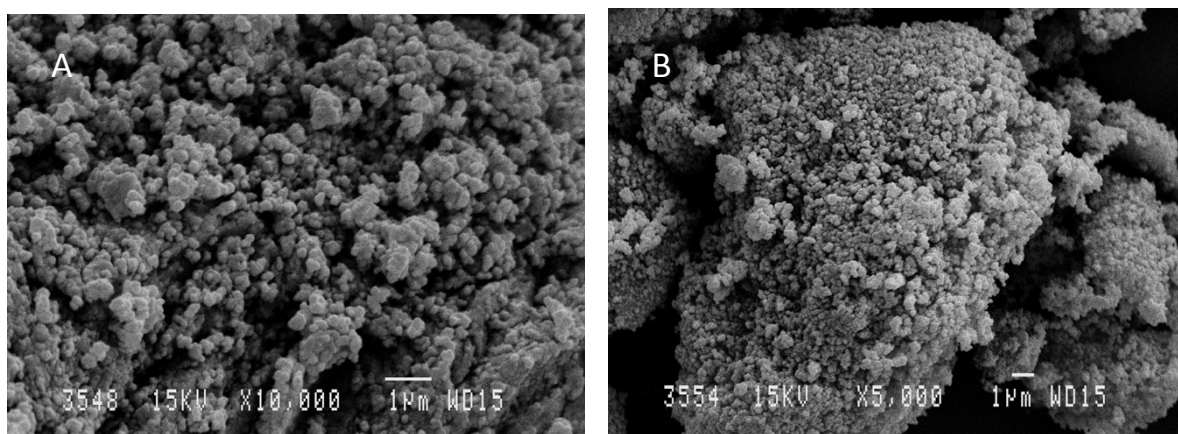


Figure S3. SEM images of two representative samples (a) ZIF-7-D-130 and (b) ZIF-7-M4-60.

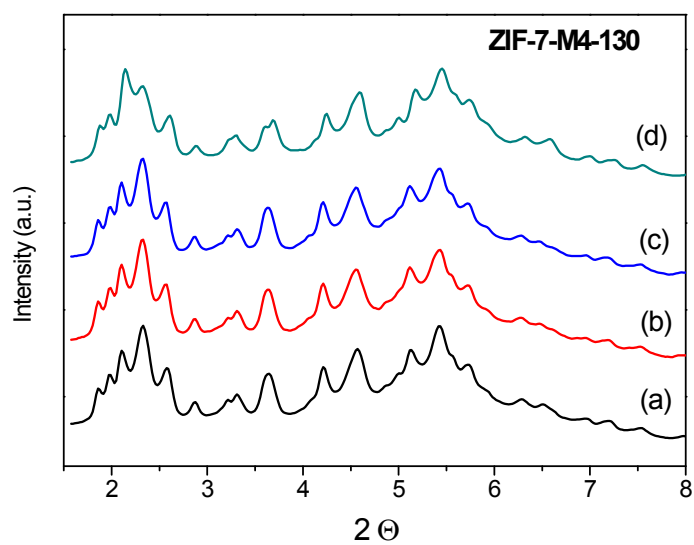


Figure S4. XRD pattern for ZIF-7-M4-130 after (a) vacuum at 298 K, heating under vacuum at 358 K for (b) 1 min and (c) 60 min, and (d) after vacuum at 80 K.

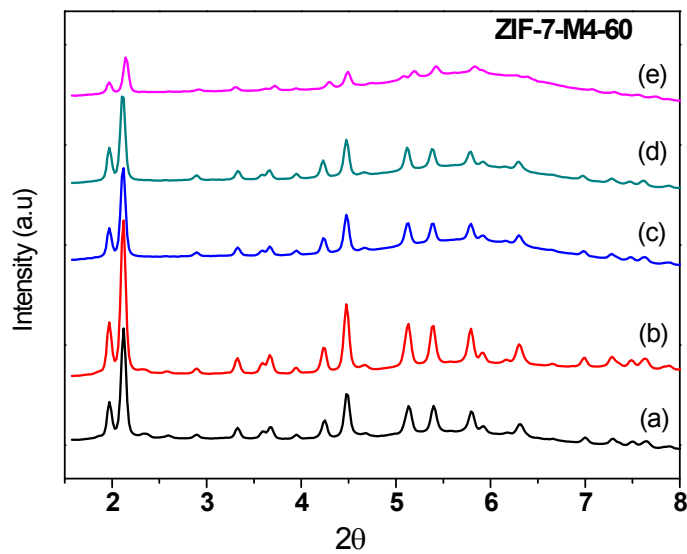


Figure S5. SXR D pattern for ZIF-7-M4-60 under (a) atmospheric pressure at 298 K, (b) vacuum at 298 K, (c) heat treatment under vacuum at 358 K, (d) heat treatment under vacuum at 458 K and (e) 80 K under vacuum.

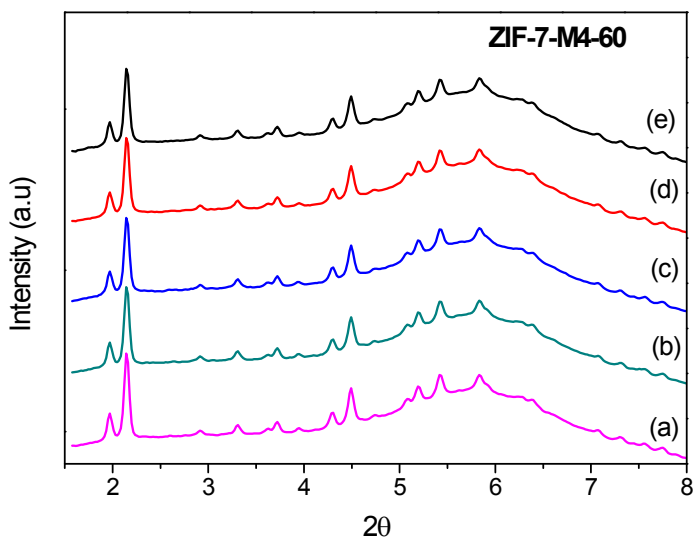


Figure S6. SXR D pattern for ZIF-7-M4-60 under (a) vacuum at 80 K, and after incorporation of N_2 at (b) 0.1 bar, (c) 0.2 bar, (d) 0.4 bar and (e) 1.0 bar.

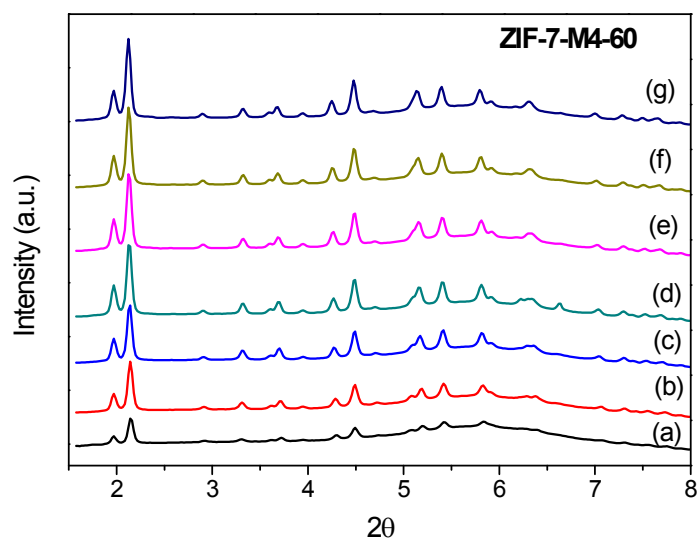


Figure S7. XRD pattern for ZIF-7-M4-60 under 1.0 bar of N₂ at (a) 90 K, (b) 130 K, (c) 170 K, (d) 210 K, (e) 250 K, (f) 273 K and (g) 298 K.

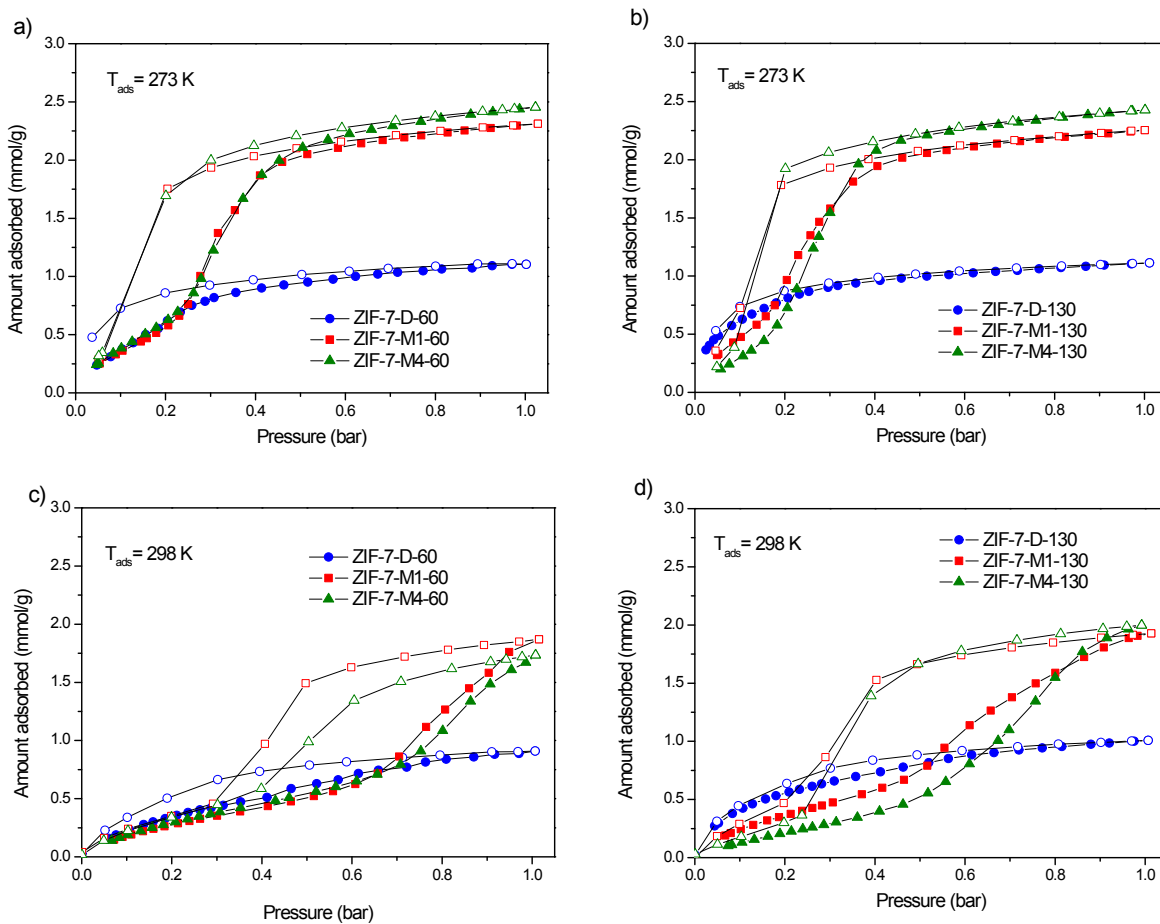


Figure S8. CO₂ adsorption/desorption isotherms versus total pressure at 273K and 298K for all ZIF-7 samples evaluated.

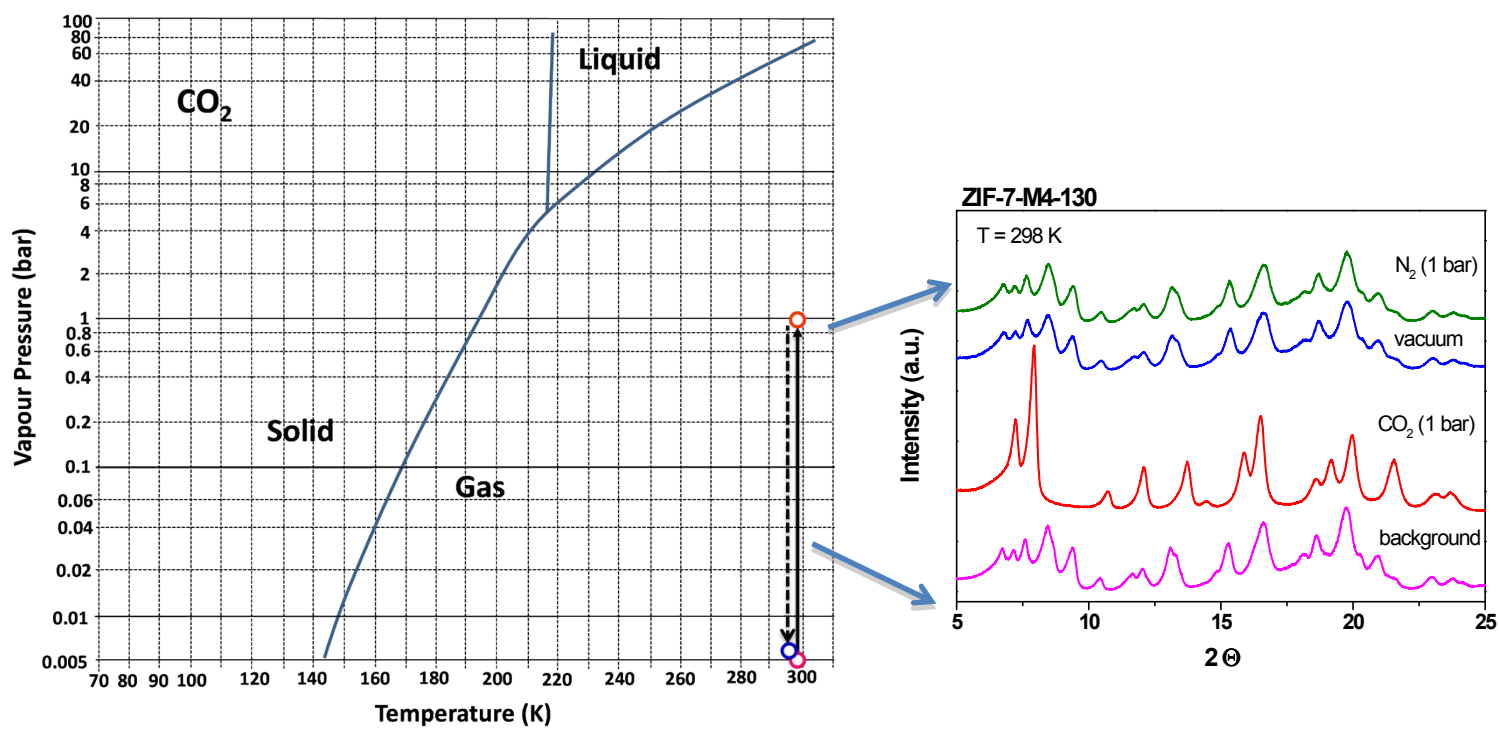


Figure S9. A. Conventional XRD pattern for ZIF-7-M4-130 at 298K as-synthesized (background), after exposure to 1 bar of CO₂, after a vacuum treatment at 298 K for 30 min and after exposure to 1 bar N₂ at the same temperature.