

Title: Supplementary Video 1.

Description: In situ optical microscopy movie of ELM-11 particles during the introduction of CO₂ at 0.8 kPa s⁻¹ and ~297 K.

Title: Supplementary Video 2.

Description: The same video as Supplementary Video 1, but in each frame, the pixels that changed from the first frame (0 s) are coloured red.

Title: Supplementary Video 3.

Description: Schematic movement of the structural transition mechanism of CO₂ gate adsorption on ELM-11.

Title: Supplementary Video 4.

Description: In situ optical microscopy movie of MIL-53(A1) particles during the introduction of CO₂ at 0.8 kPa s⁻¹ and ~297 K.

Title: Supplementary Video 5.

Description: The same video as Supplementary Video 4, but in each frame, the pixels that changed from the first frame (0 s) are coloured red.

Title: Supplementary Video 6.

Description: In situ optical microscopy movie of CuFB particles during the introduction of CO₂ at 0.8 kPa s⁻¹ and ~297 K.

Title: Supplementary Video 7.

Description: The same video as Supplementary Video 6, but in each frame, the pixels that changed from the first frame (0 s) are coloured red.