

Unveiled the Source of the Structural Instability of HKUST-1 Powders upon Mechanical Compaction: Definition of a Fully Preserving Tableting Method

AUTHOR NAMES

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Table S1: List of the main samples, with the description of the main treatments and the estimate of the water content.

Name of the sample	Parent Material	Reactivation post activation and/or tableting	Water content (number of water molecules for Cu ²⁺ ion)
Powder (Activated)	Activated Powder	5 weeks later	0.6 (after being handled in air)
Tablet B	Activated Powder	just after tableting	0.67
Tablets A	Activated Powder	5 weeks later	1.0
Tablet H2-40MPa	H2	5 weeks later	2.1
Tablet H1-40MPa	H1	NO	3.8

1. IMAGES OF SOME OF THE SAMPLES

Figure S1 shows the HKUST-1 some of the obtained tablets, with a pressure of (a) 1, (b) 3, (c) 10, (d) 20 and (e) 40 MPa. The tablets look self-standing only starting from 30 MPa upwards.

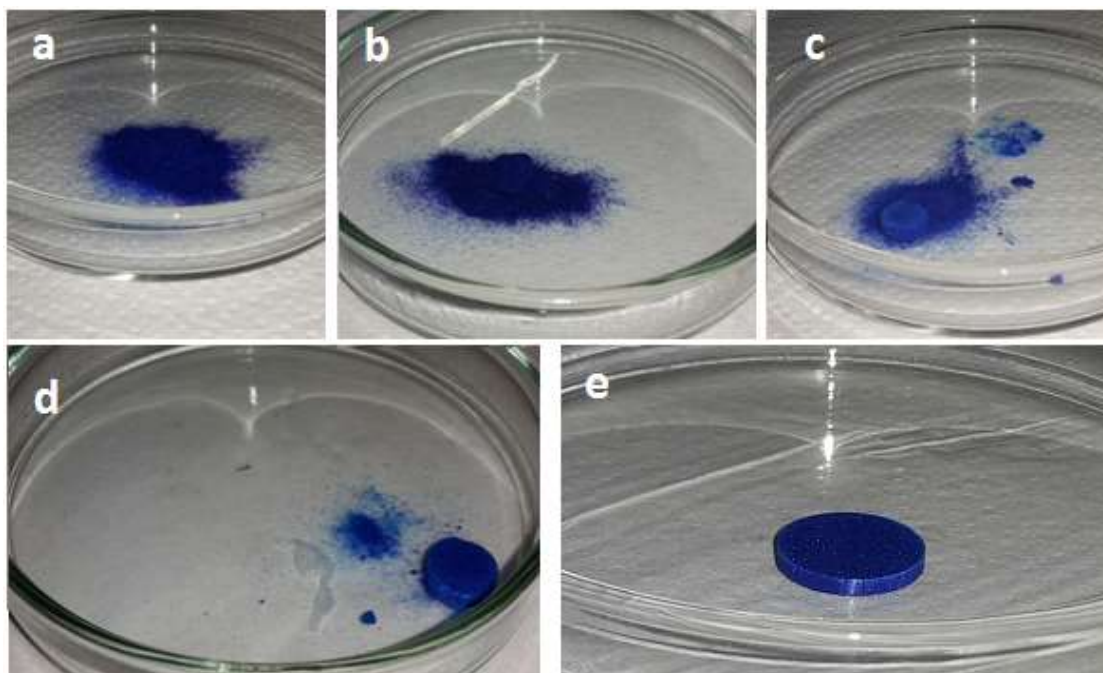


Figure S1 - A-type tablets.

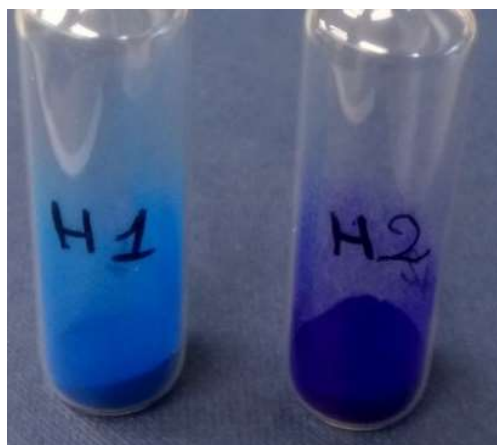


Figure S2 – Hydrated powder samples before the tableting for H1-40 MPa and H2-40 MPa tablets respectively.

2. EPR MEASUREMENTS

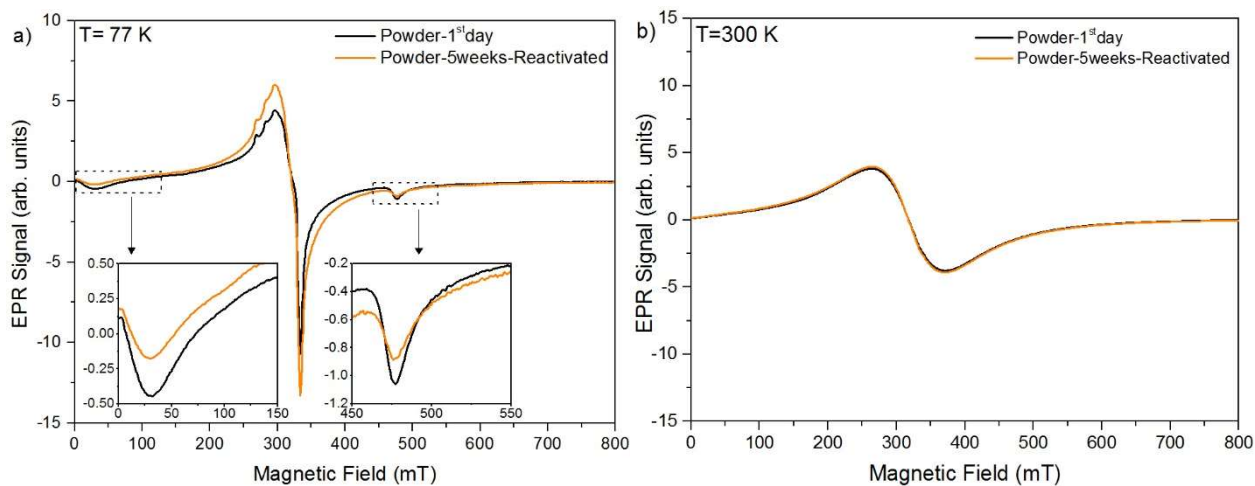


Figure S3 - EPR spectra acquired at 77 K (a) and 300 K (b) of the Powder sample reactivated after 5 weeks of aging (orange). In black, the corresponding spectra of Powder-1st day are also shown for comparison.

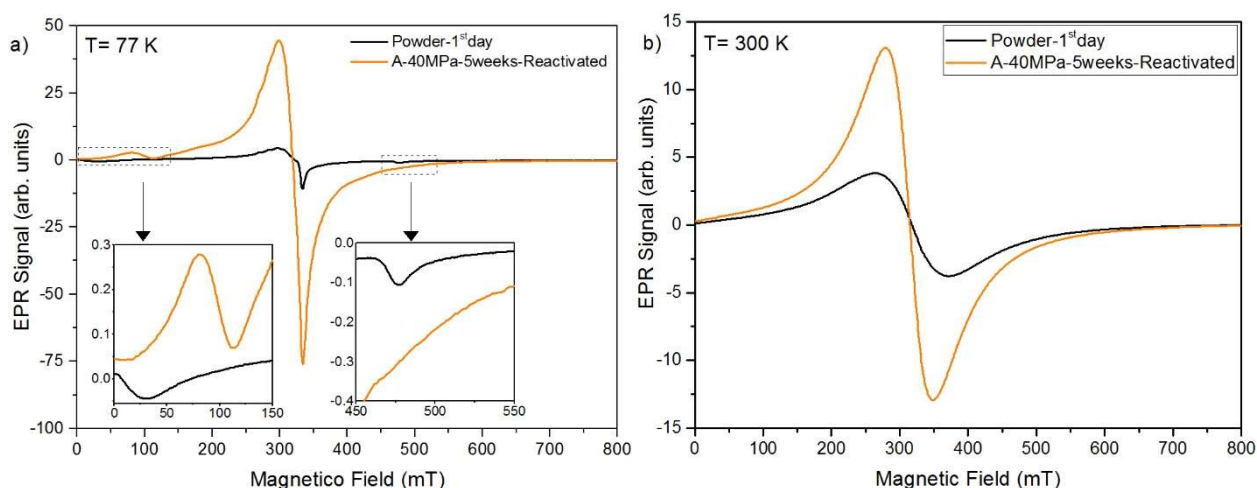


Figure S4 - EPR spectra acquired at 77 K (a) and 300 K (b) of the sample A-40MPa reactivated after 5 weeks of aging from the tableting (orange). In black, the corresponding spectra of Powder-1stday are also shown for comparison.

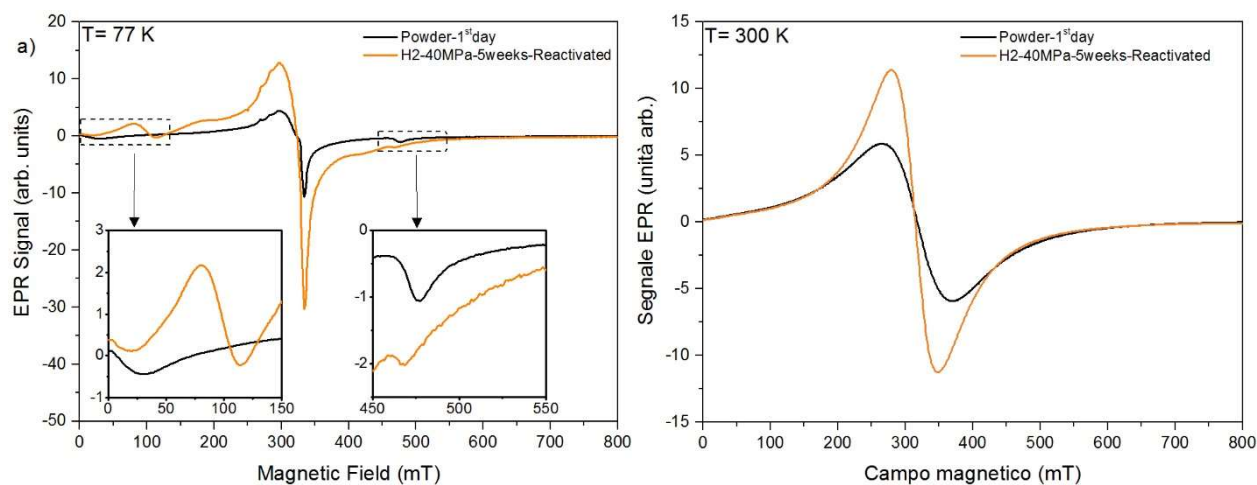


Figure S5 - EPR spectra acquired at 77 K (a) and 300 K (b) of the sample H2-40MPa reactivated 5 weeks after the tableting (orange). In black, the corresponding spectra of Powder-1stday are also shown for comparison.

3. OPTICAL AND AFM IMAGES

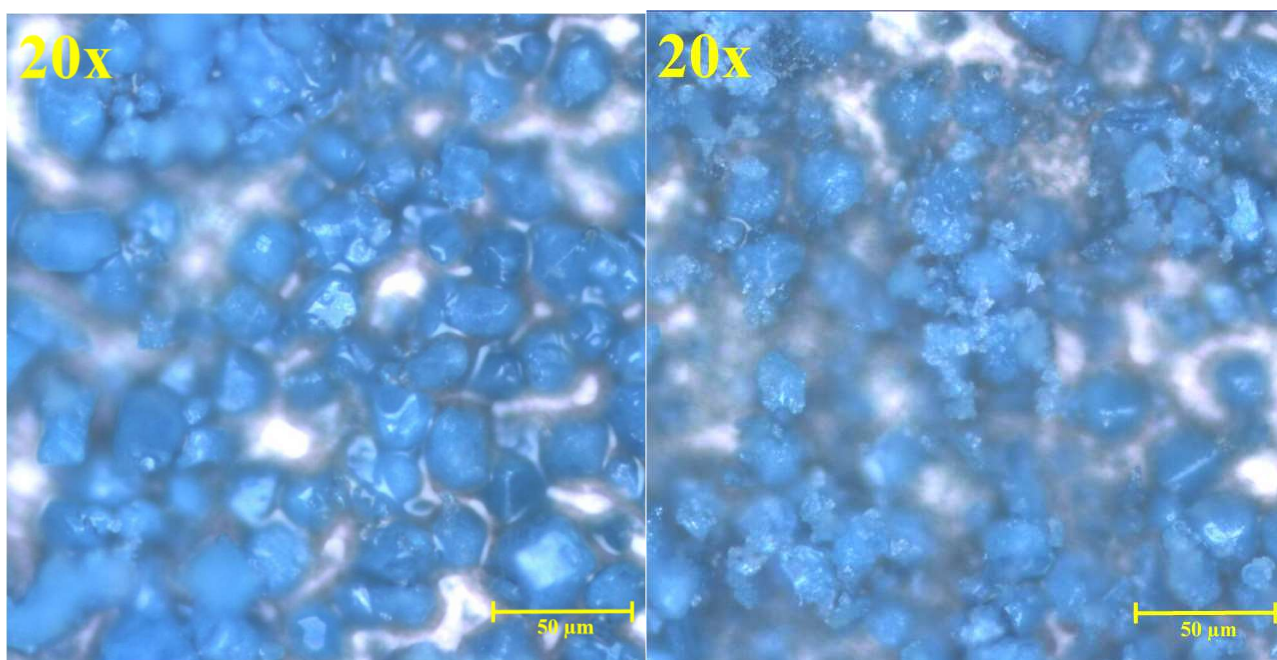


Figure S6 - 20x optical images of HKUST-1 powder.

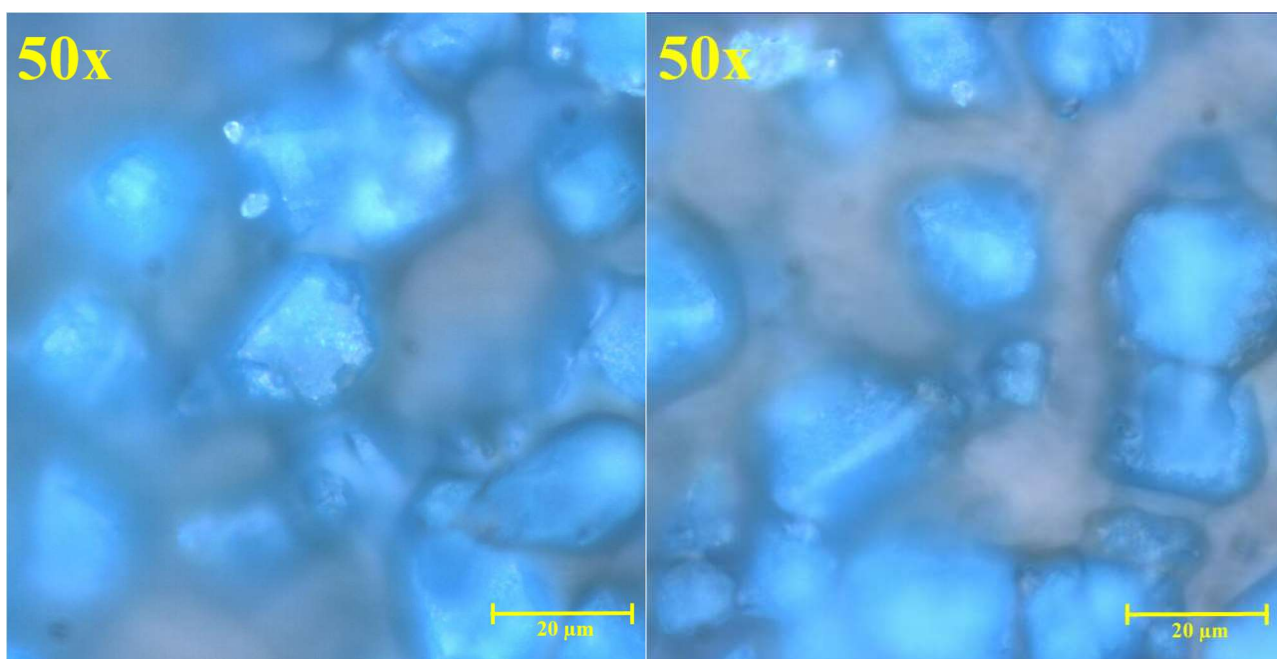


Figure S7 - 50x optical image of HKUST-1 powder.

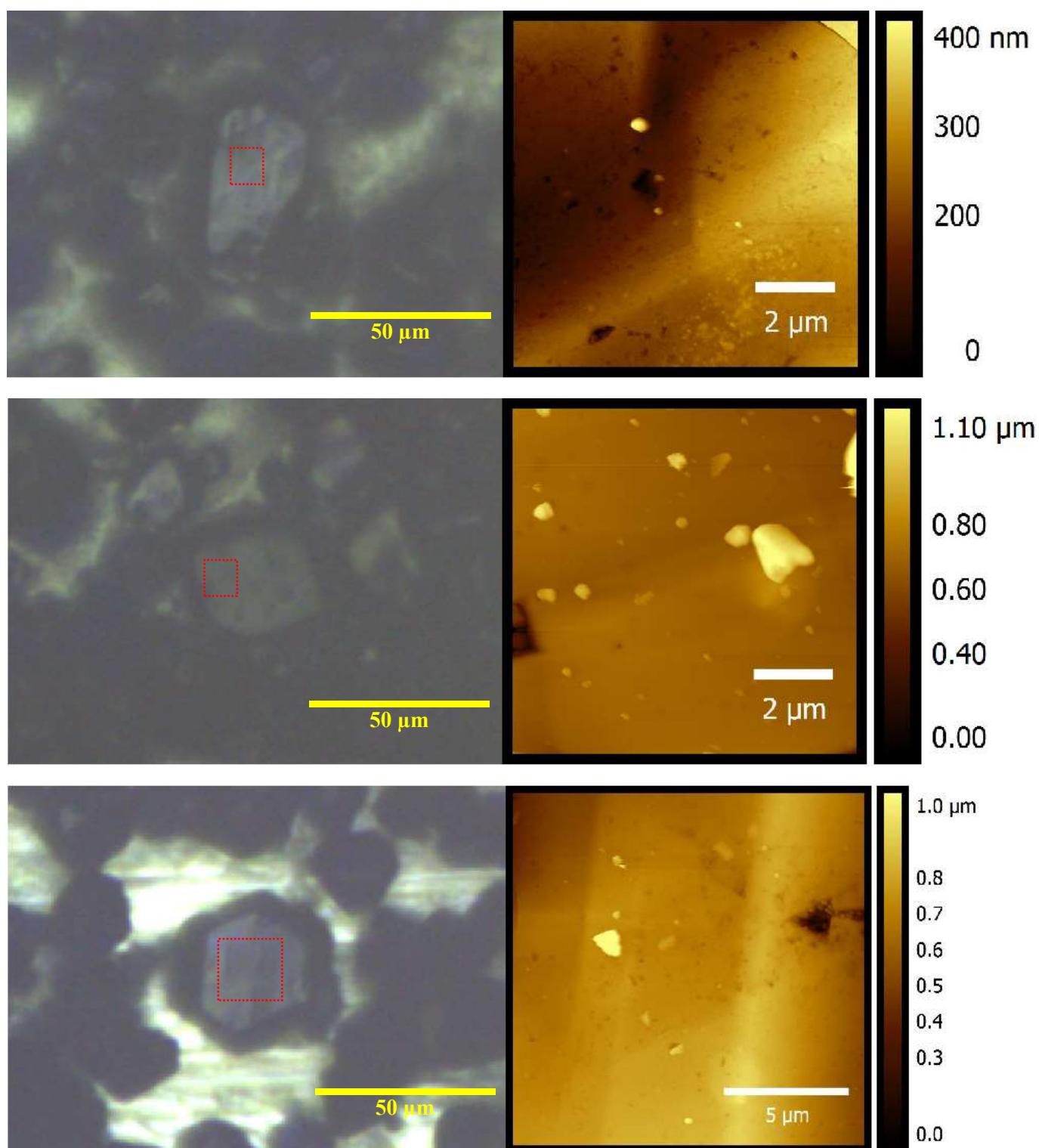


Figure S8 - Optical and AFM images of HKUST-1 powder.

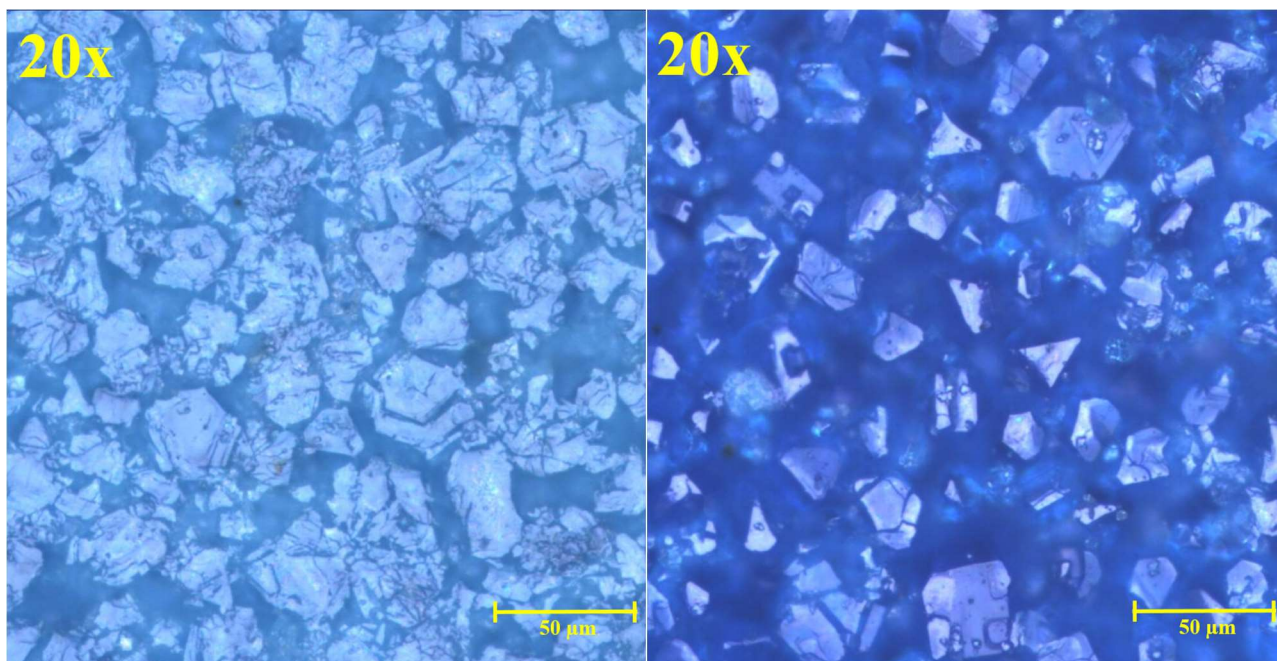


Figure S9 - 20x optical images of HKUST-1 tablet B-40MPa.

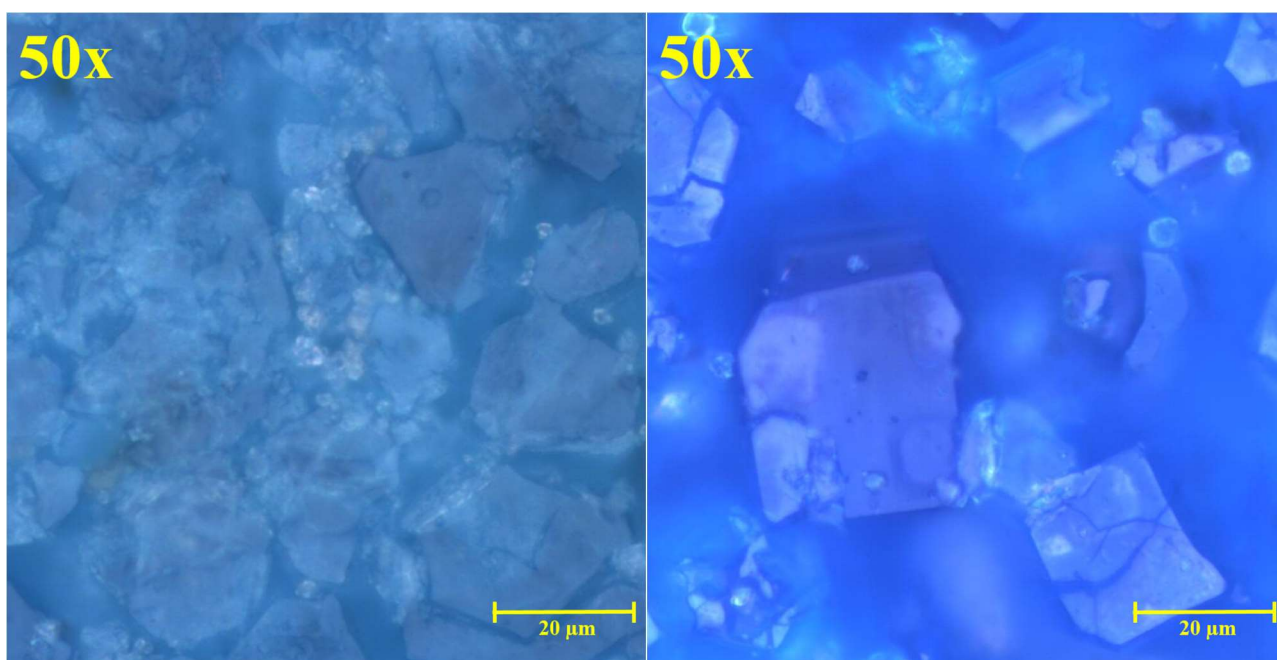


Figure S10 - 50x optical images of HKUST-1 tablet B-40MPa.

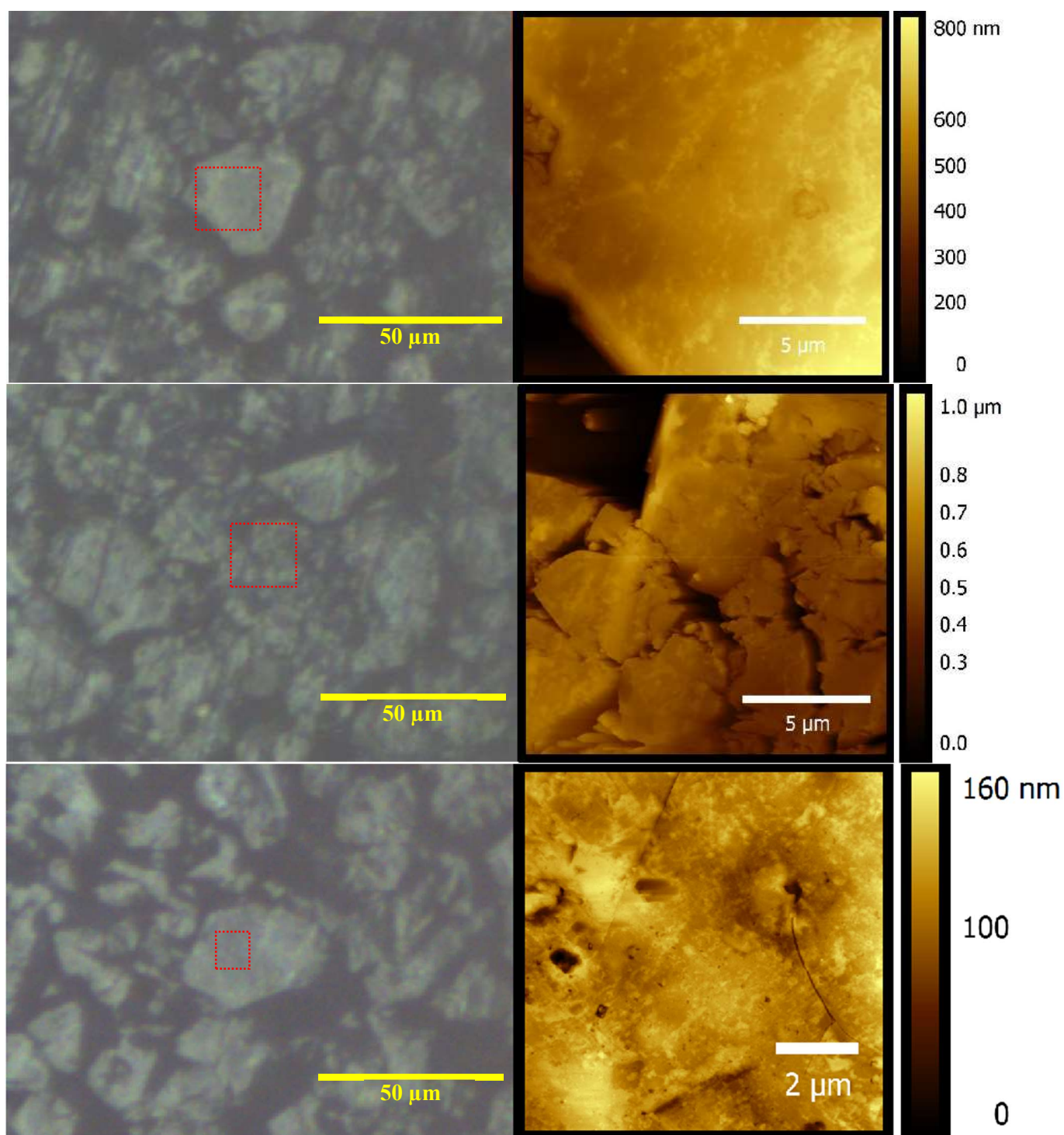


Figure S11 - Optical and AFM images of HKUST-1 tablet B-40MPa.

4. WATER ISOTHERMS

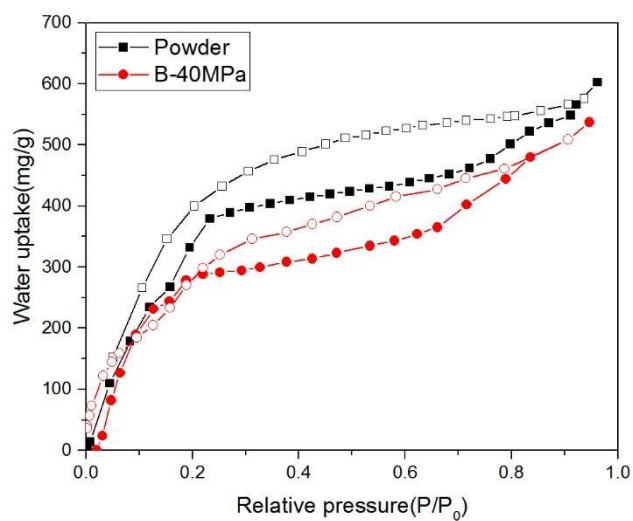


Figure S12 - Water isotherms of the samples Powder (black squares) and B-40MPa (red circles) measured at 25 °C. Adsorption – full points, desorption – empty points.

5. IR SPECTRA

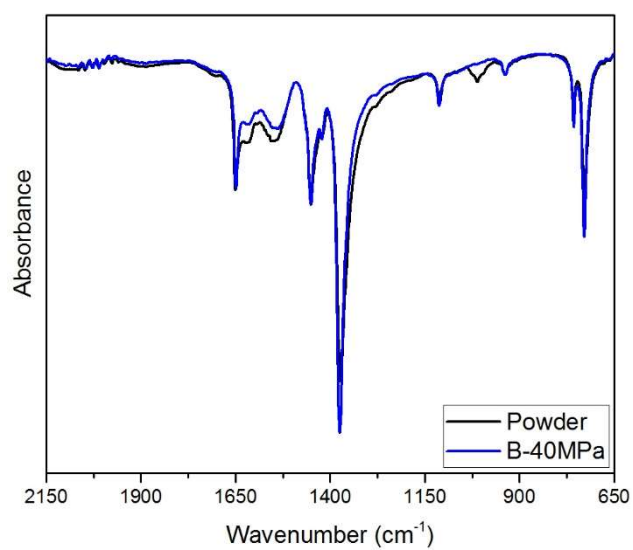


Figure S13 - IR spectra of the samples Powder (blue) and B-40MPa (black).

6. TGA MEASUREMENTS

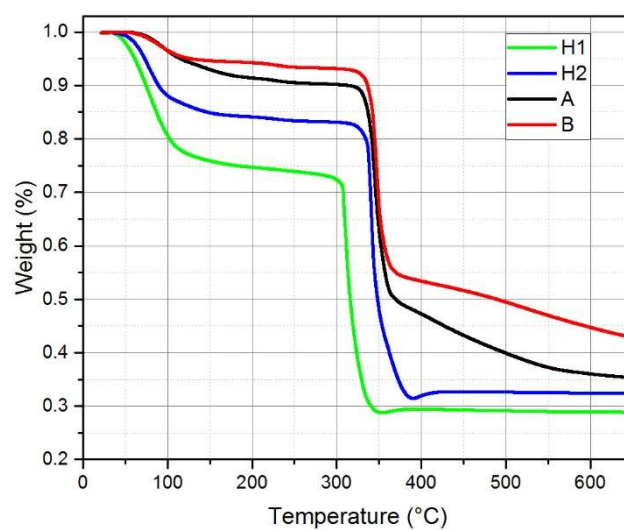


Figure S14 - Normalized TGA traces of HKUST-1 tablets B-40MPa (red) and A-40MPa (black), and hydrated powder samples H1 (green) and H2 (blue).