

Experimental volumetric hydrogen uptake determination at cryogenic temperature of commercially available Metal-Organic Framework materials

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Supporting information

Characterization of MOFs

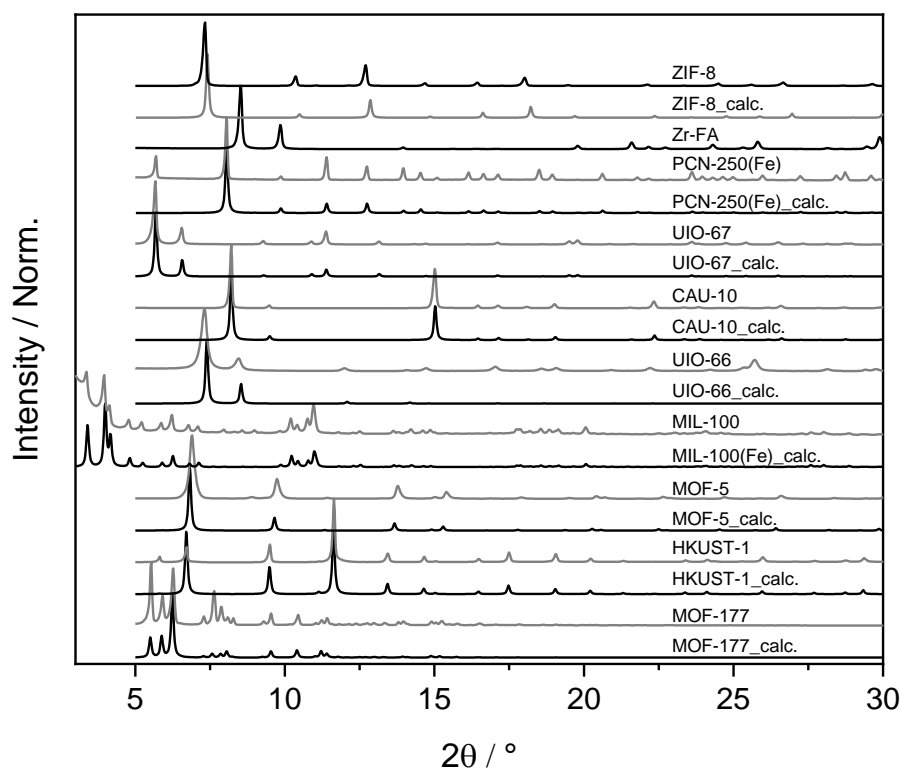


Figure S1. PXRD of MOFs compared with the calculated PXRD pattern from their deposited crystallographic information in the CSD (Cambridge Structures Database).

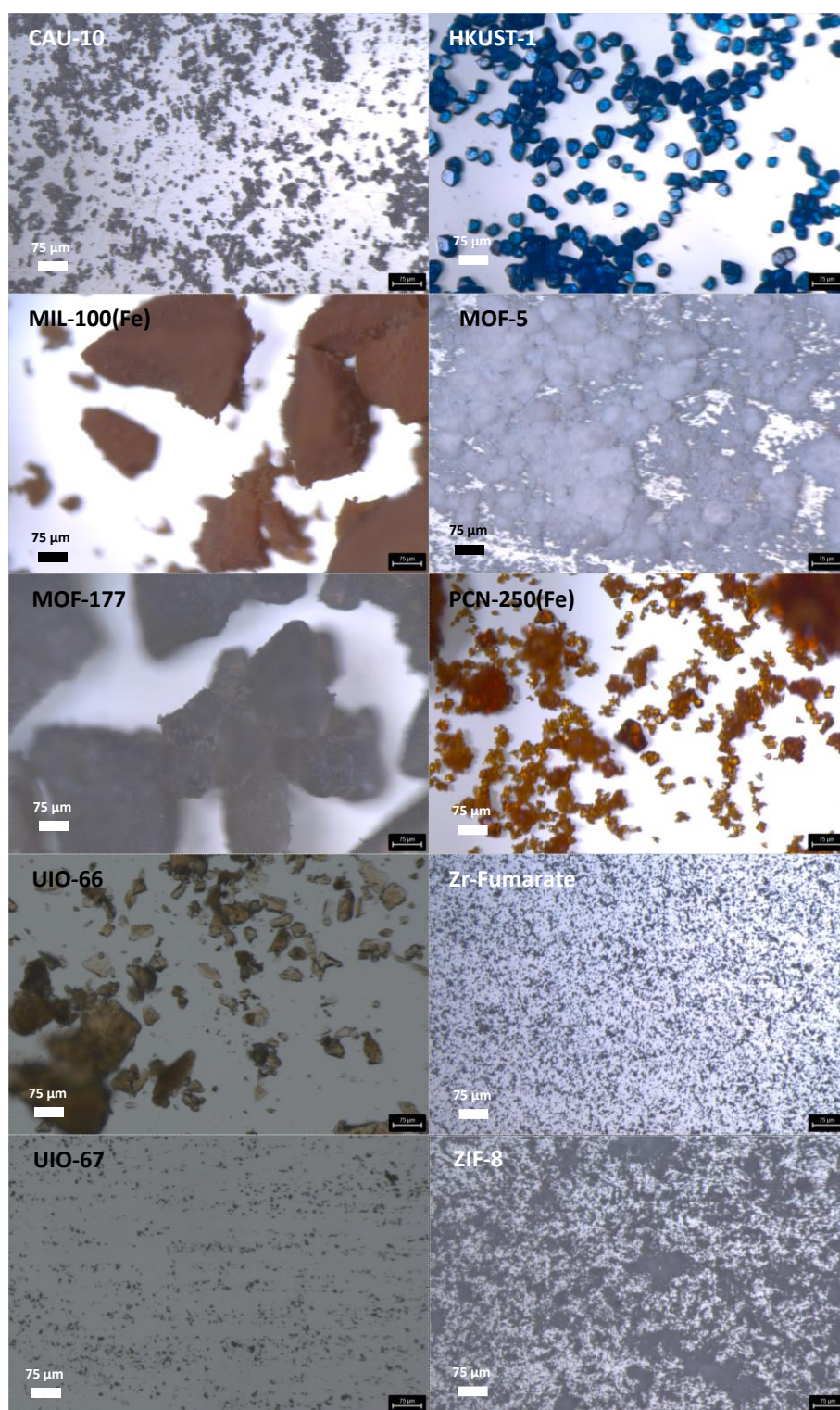


Figure S2. Microscopy images of MOFs after hydrogen adsorption experiments.

Hydrogen adsorption measurements

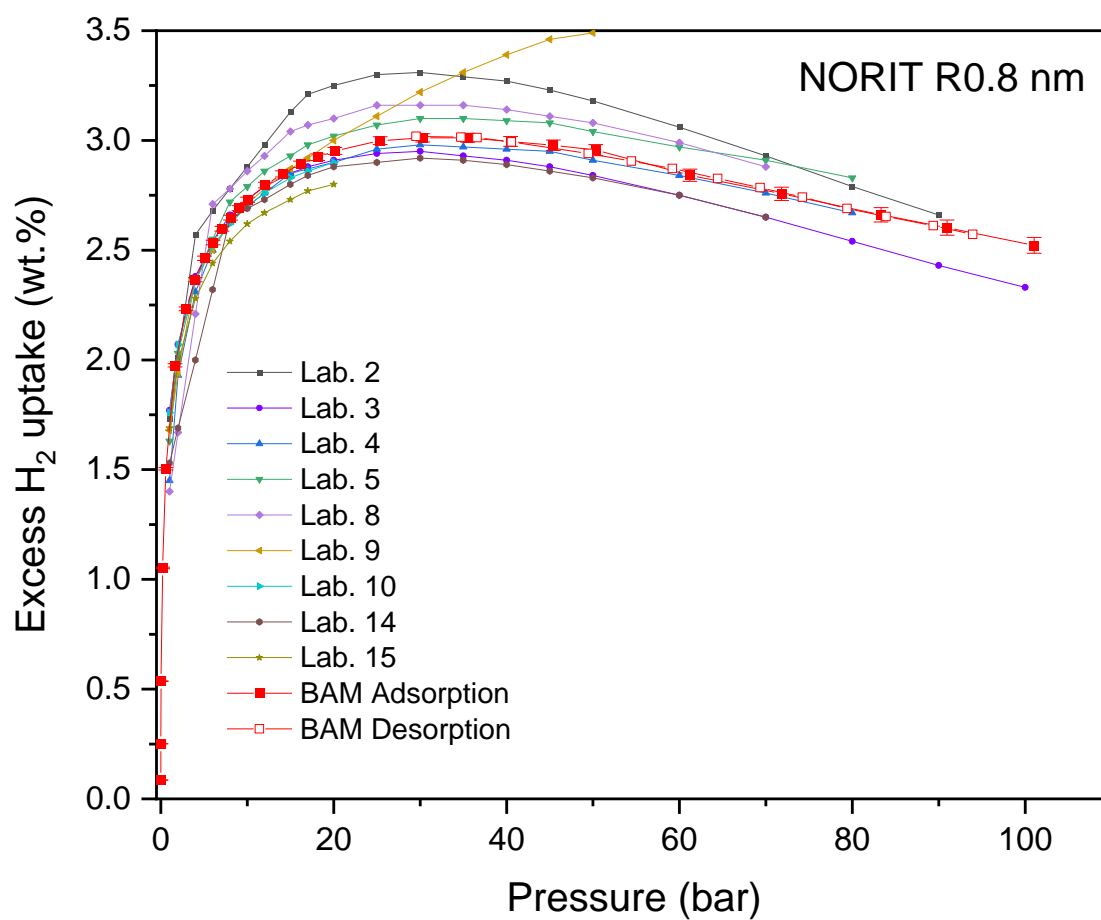


Figure S3. hydrogen adsorption-desorption isotherms at 77 K of material NORIT RAW 0.8 nm collected by BAM and compared to other measurements by other laboratories [40].

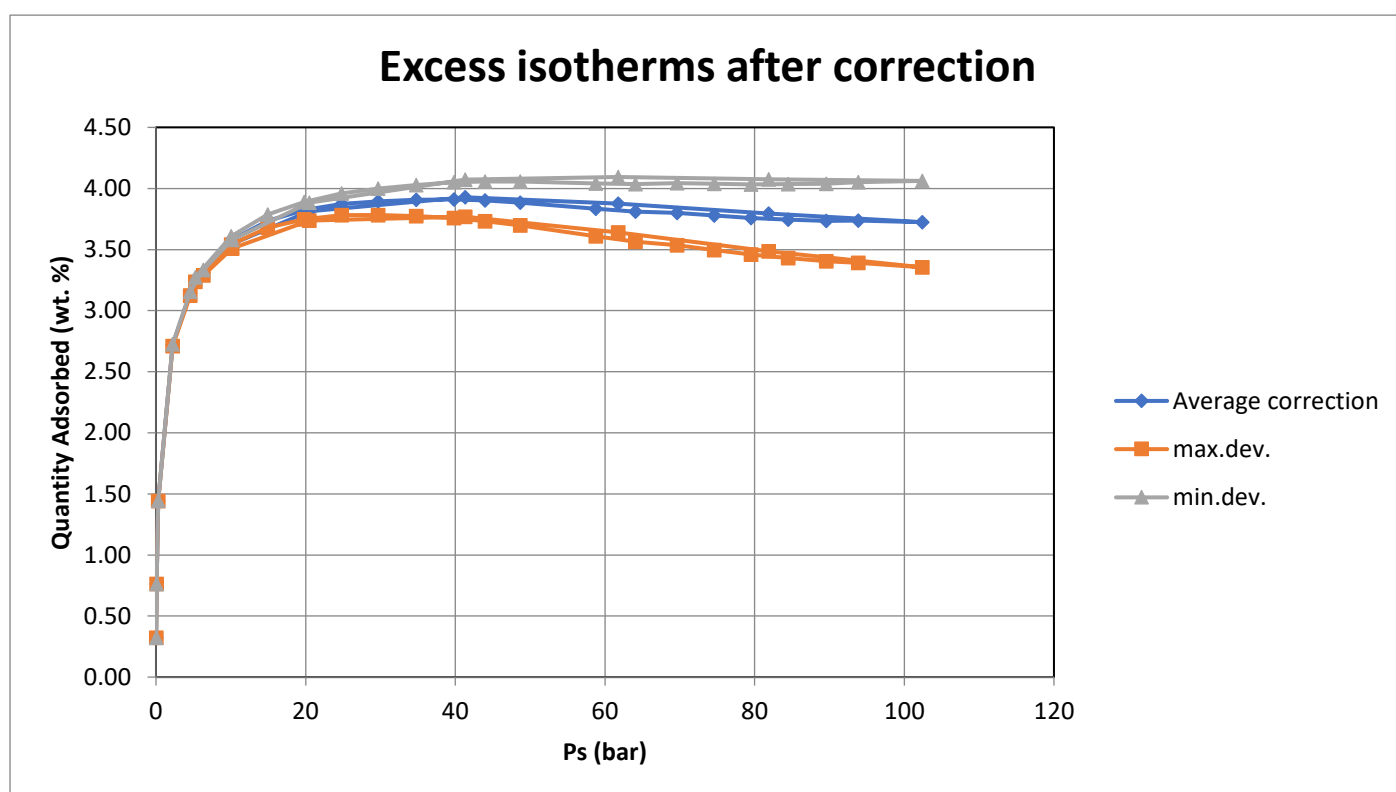


Figure S4. Corrected excess isotherms at 77 K for material HKUST-1 using the lowest, highest, and average correction factors.

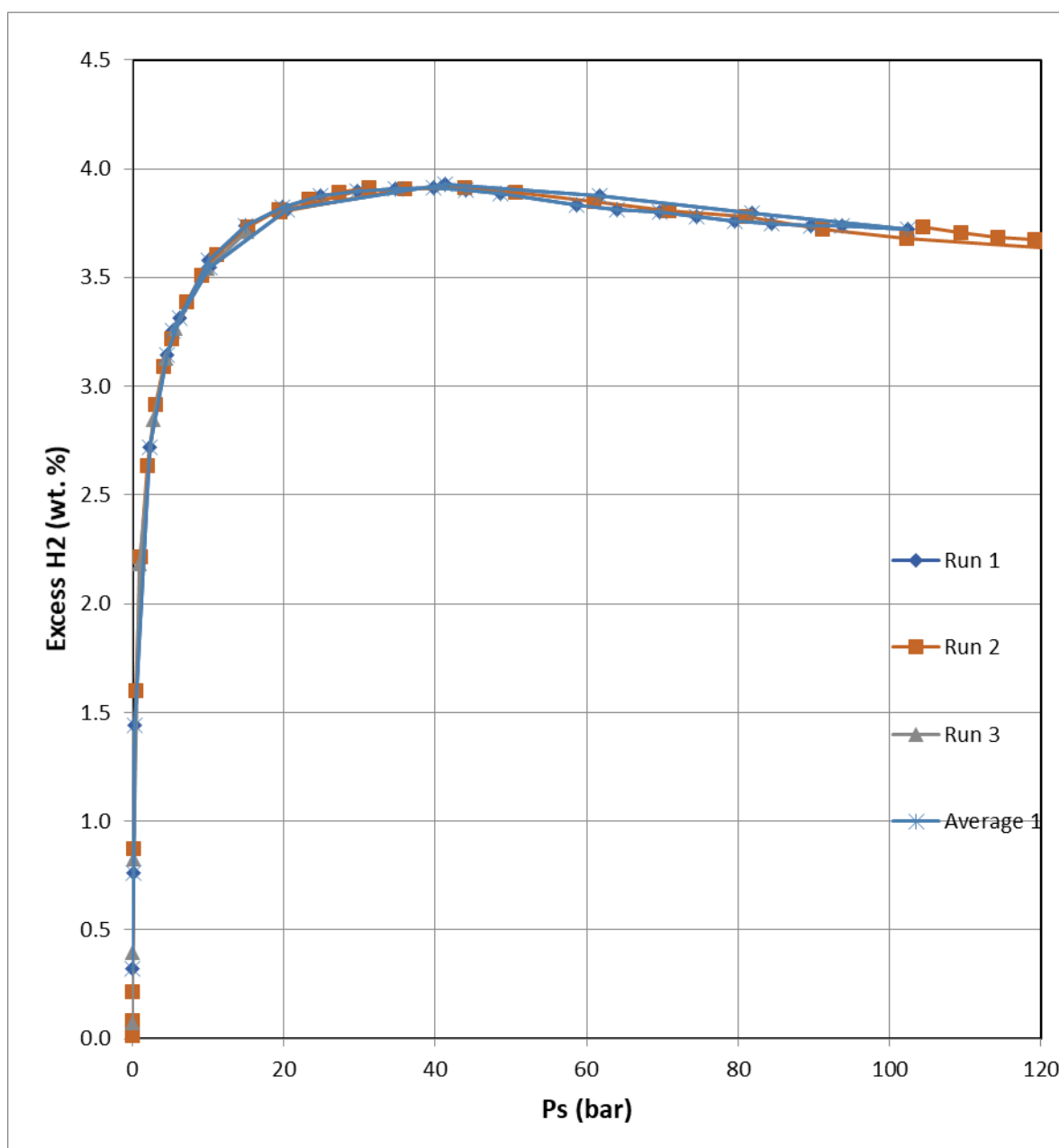


Figure S5. hydrogen adsorption-desorption isotherms at 77 K of material HKUST-1. Run 1, 2, and 3 use 479 mg (878 m²). Run 4, 5, and 6 use 0.918 mg (1388 m²).

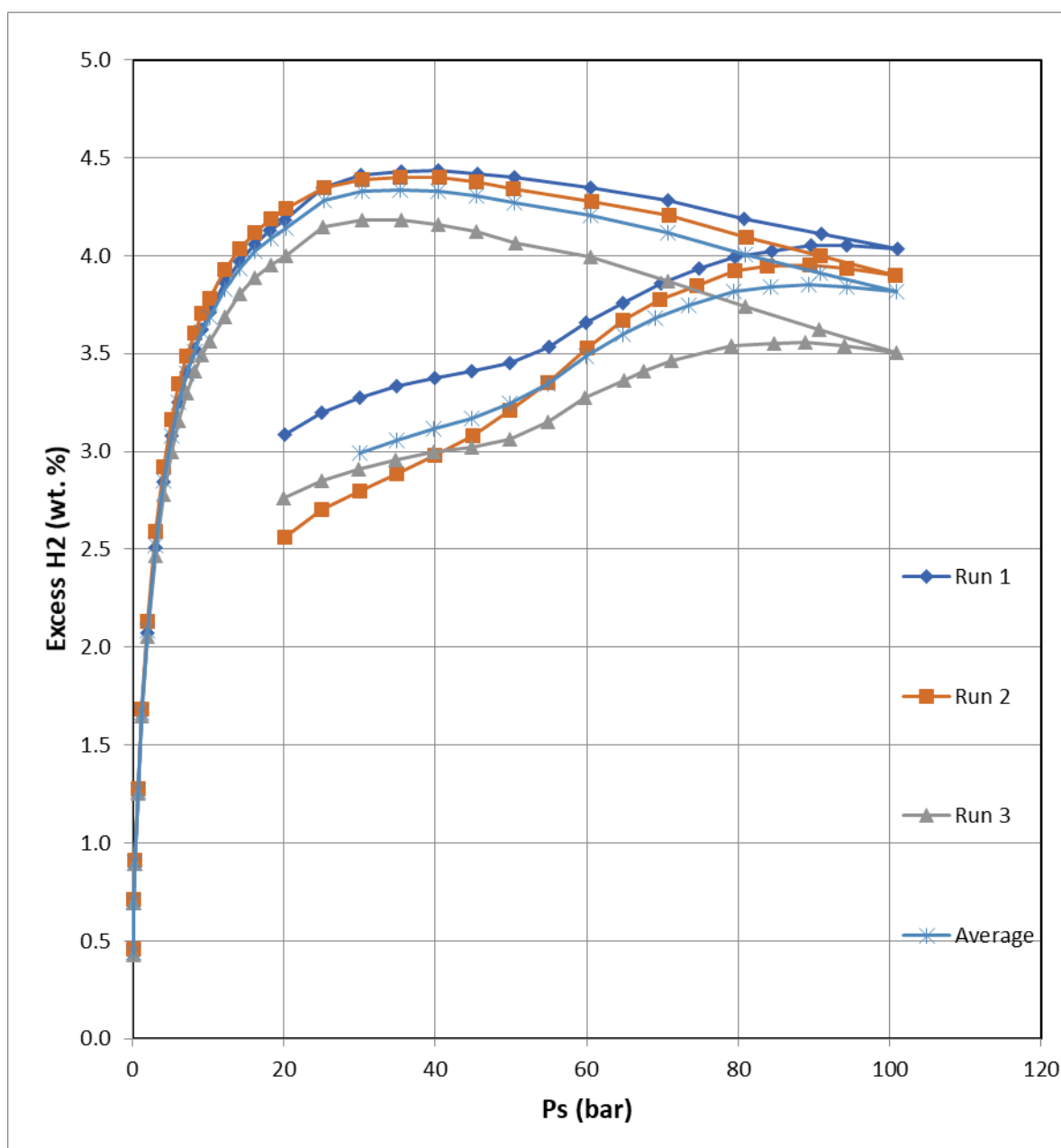


Figure S6. hydrogen adsorption-desorption isotherms at 77 K of material UIO-67. 502 mg (1071 m²).

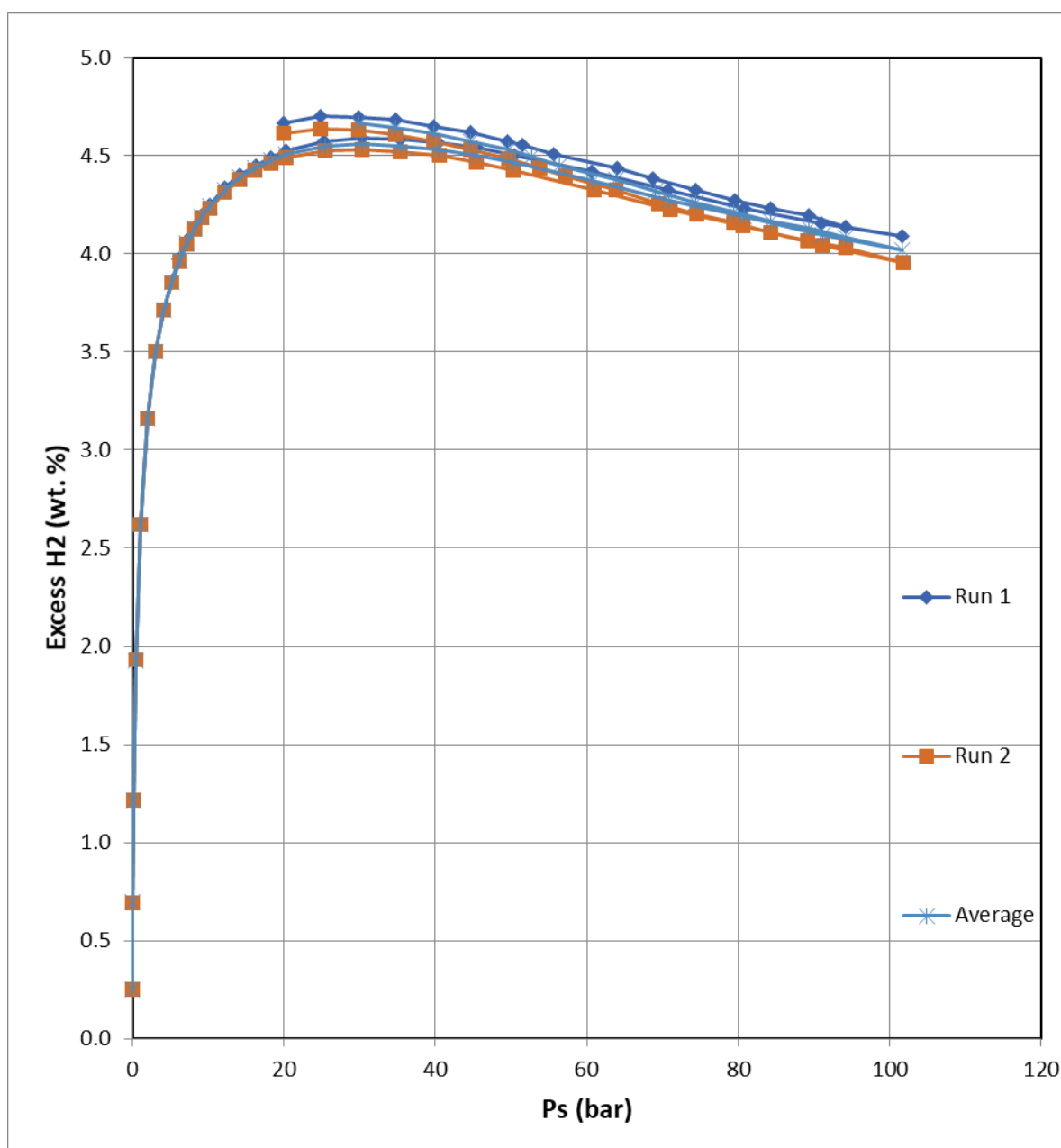


Figure S7. hydrogen adsorption-desorption isotherms at 77 K of material PCN-250(Fe). 381 mg (691 m²).

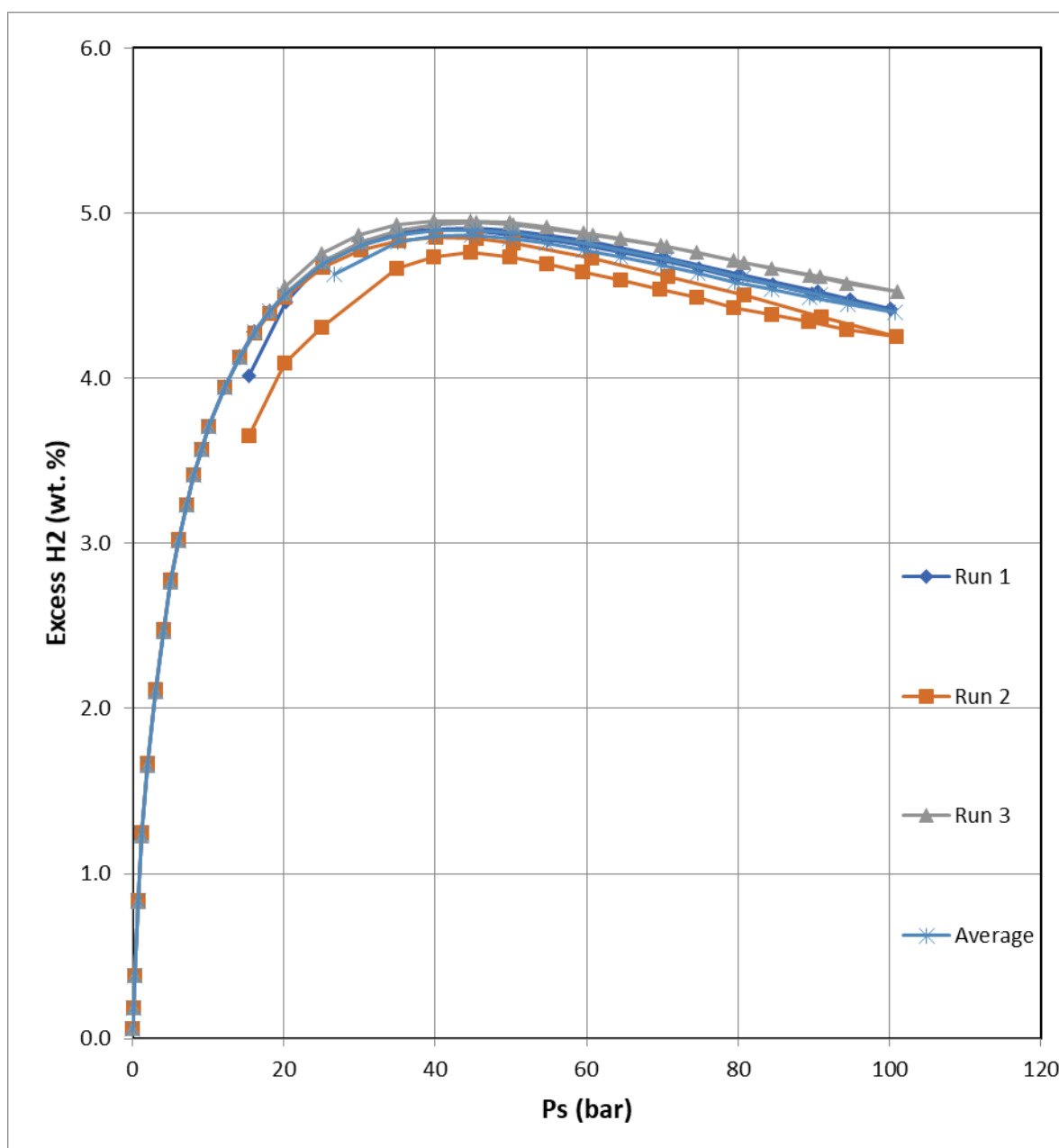


Figure S8. hydrogen adsorption-desorption isotherms at 77 K of material MOF-5. 354 mg (699 m²).

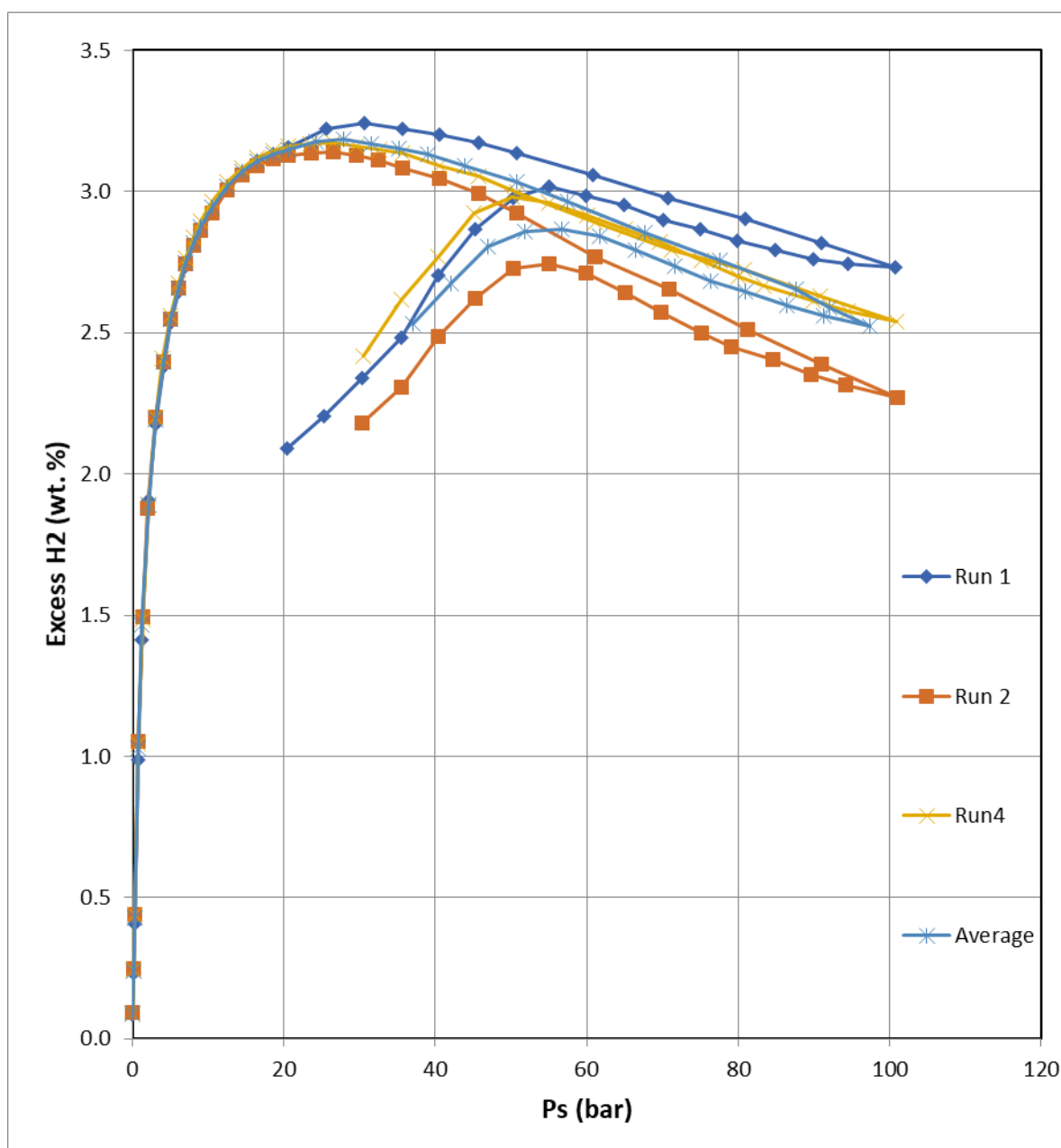


Figure S9. hydrogen adsorption-desorption isotherms at 77 K of material ZIF-8. 460 mg (797 m²).

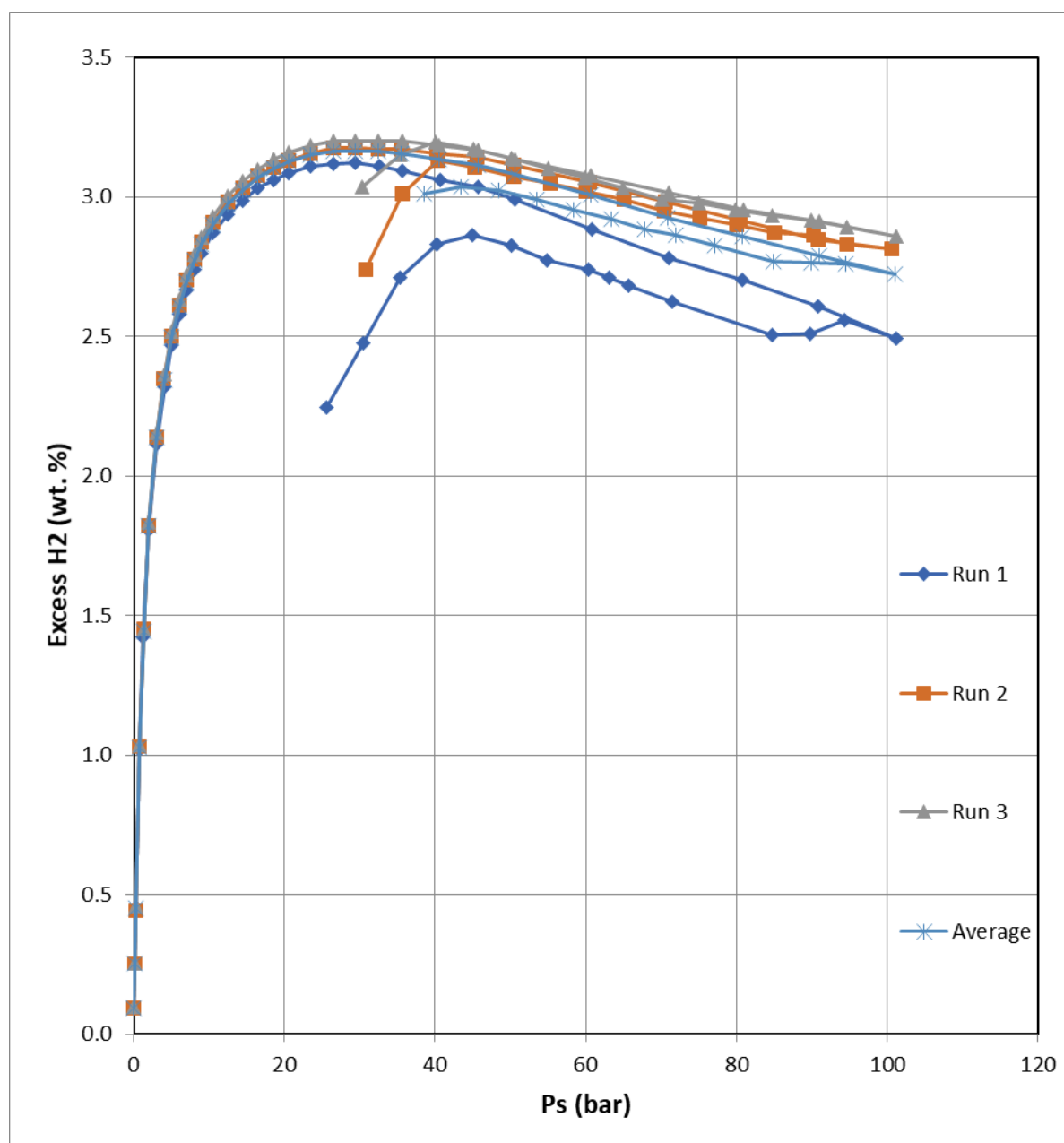


Figure S10. hydrogen adsorption-desorption isotherms at 77 K of material ZIF-8_packed. 430 mg (746 m²).

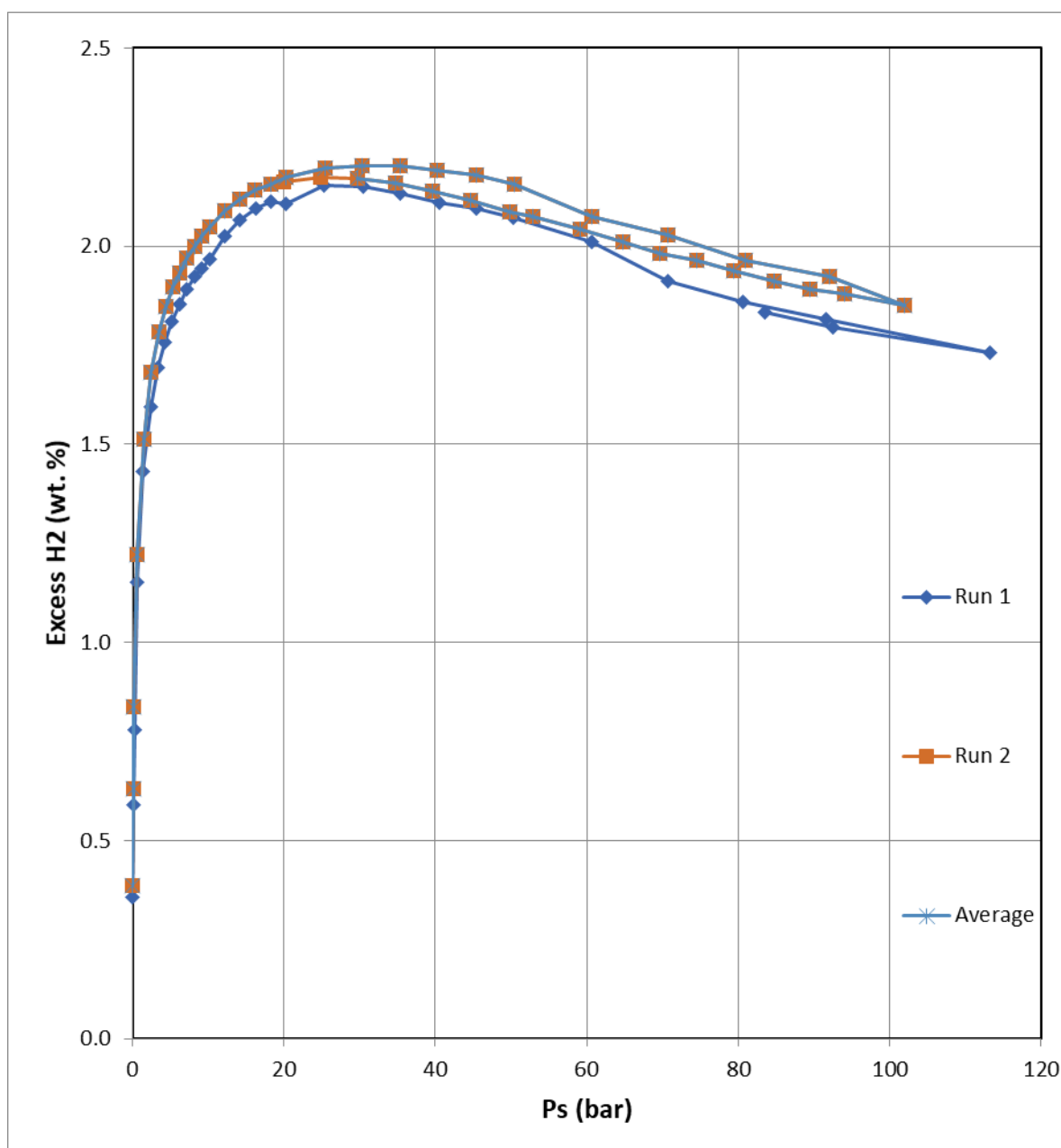


Figure S11. hydrogen adsorption-desorption isotherms at 77 K of material Zr-Fumarate. 658 mg (472 m²).

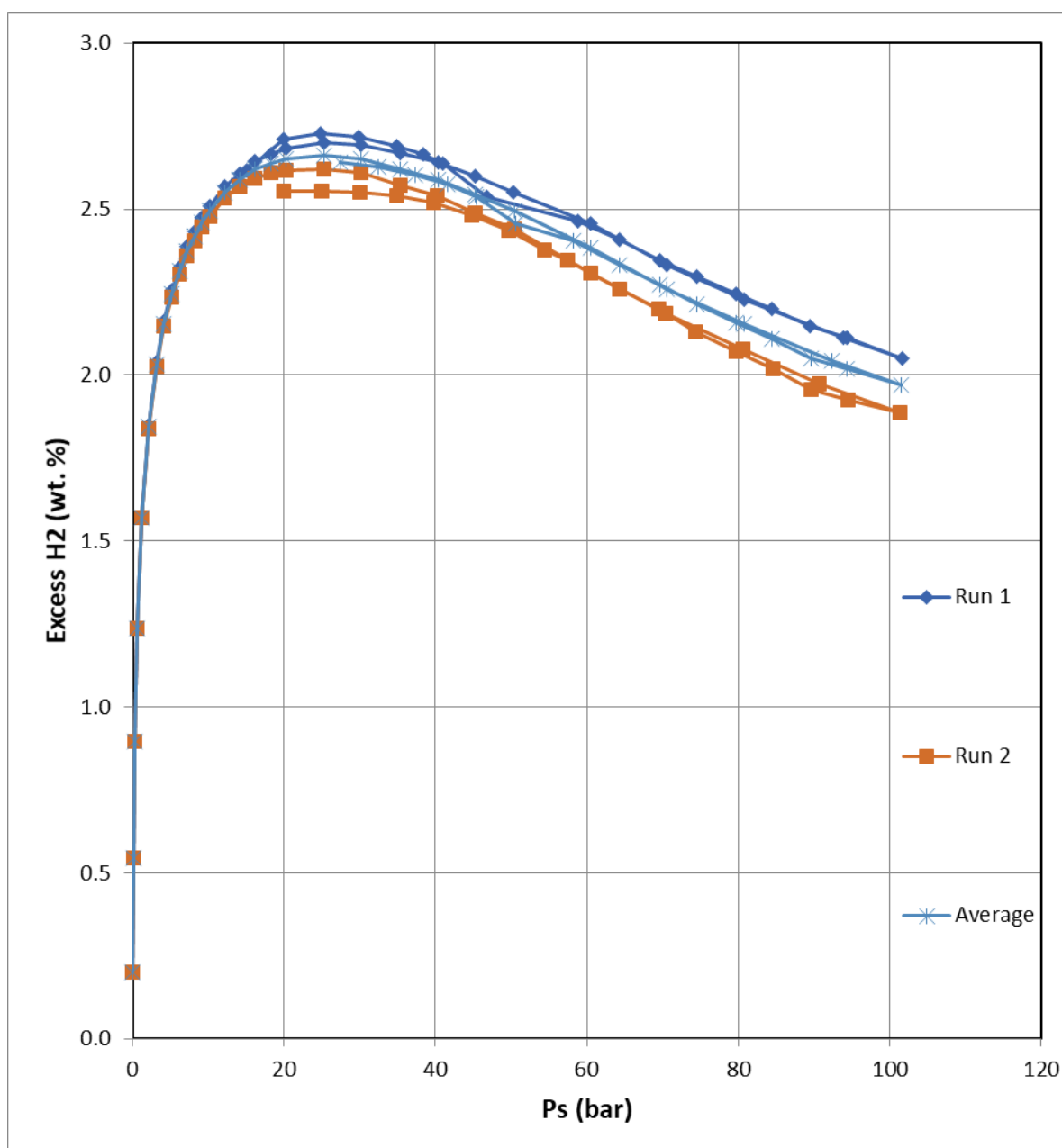


Figure S12. hydrogen adsorption-desorption isotherms at 77 K of material UIO-66. 480 mg (577 m²).

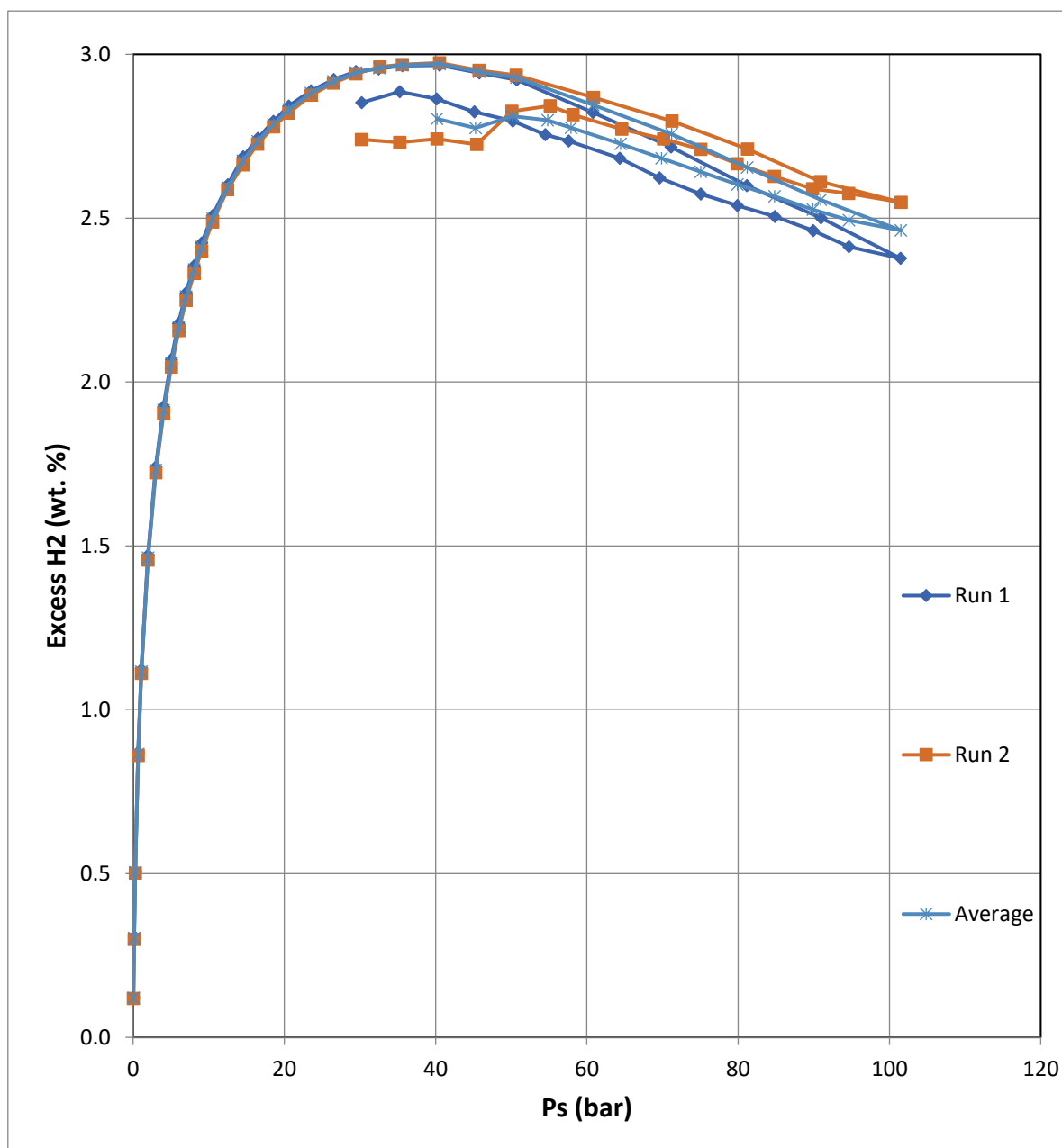


Figure S13. hydrogen adsorption-desorption isotherms at 77 K of material MIL-100(Fe). 400 mg (806 m²).

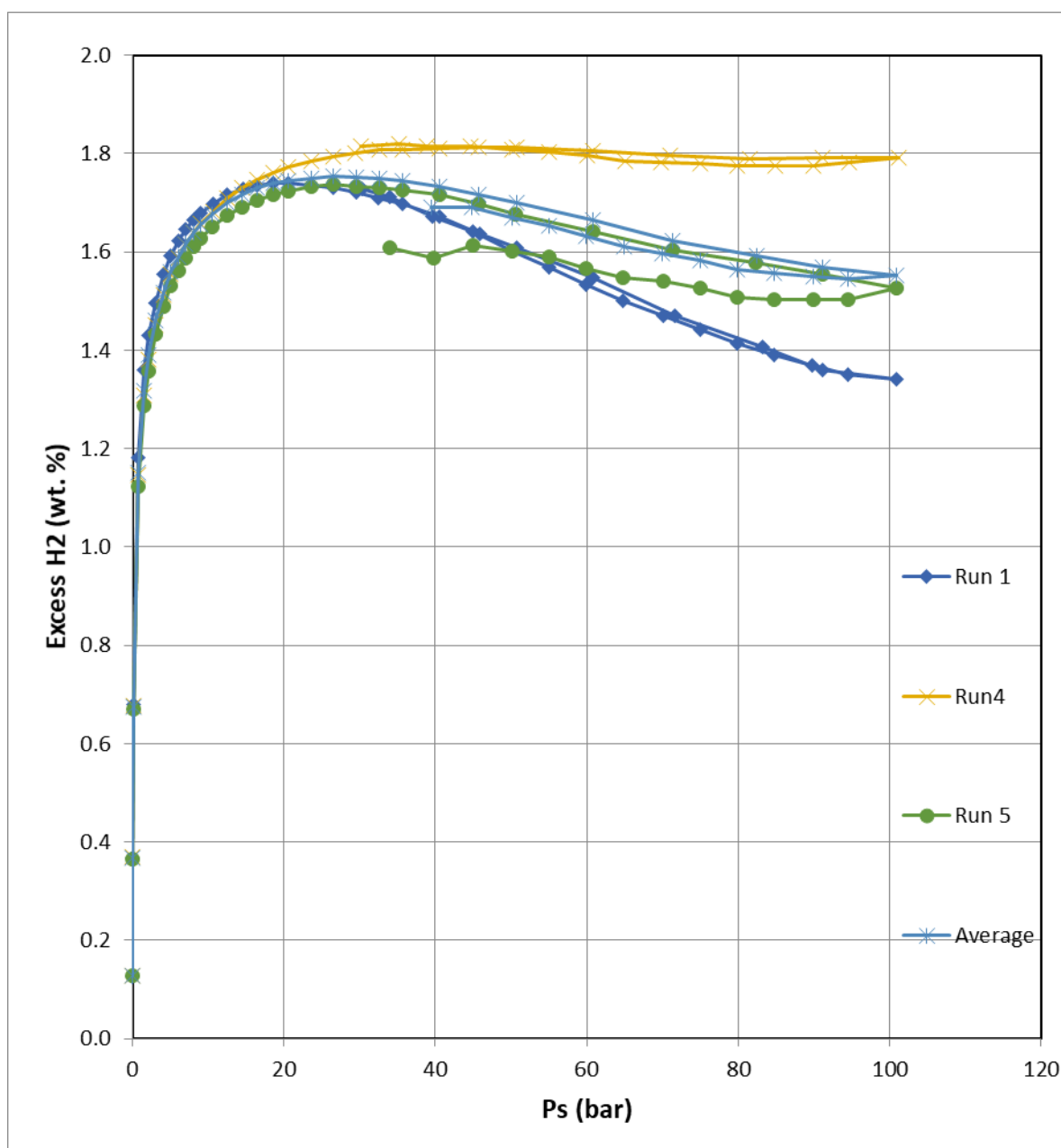


Figure S14. hydrogen adsorption-desorption isotherms at 77 K of material CAU-10. 496 mg (312 m²).

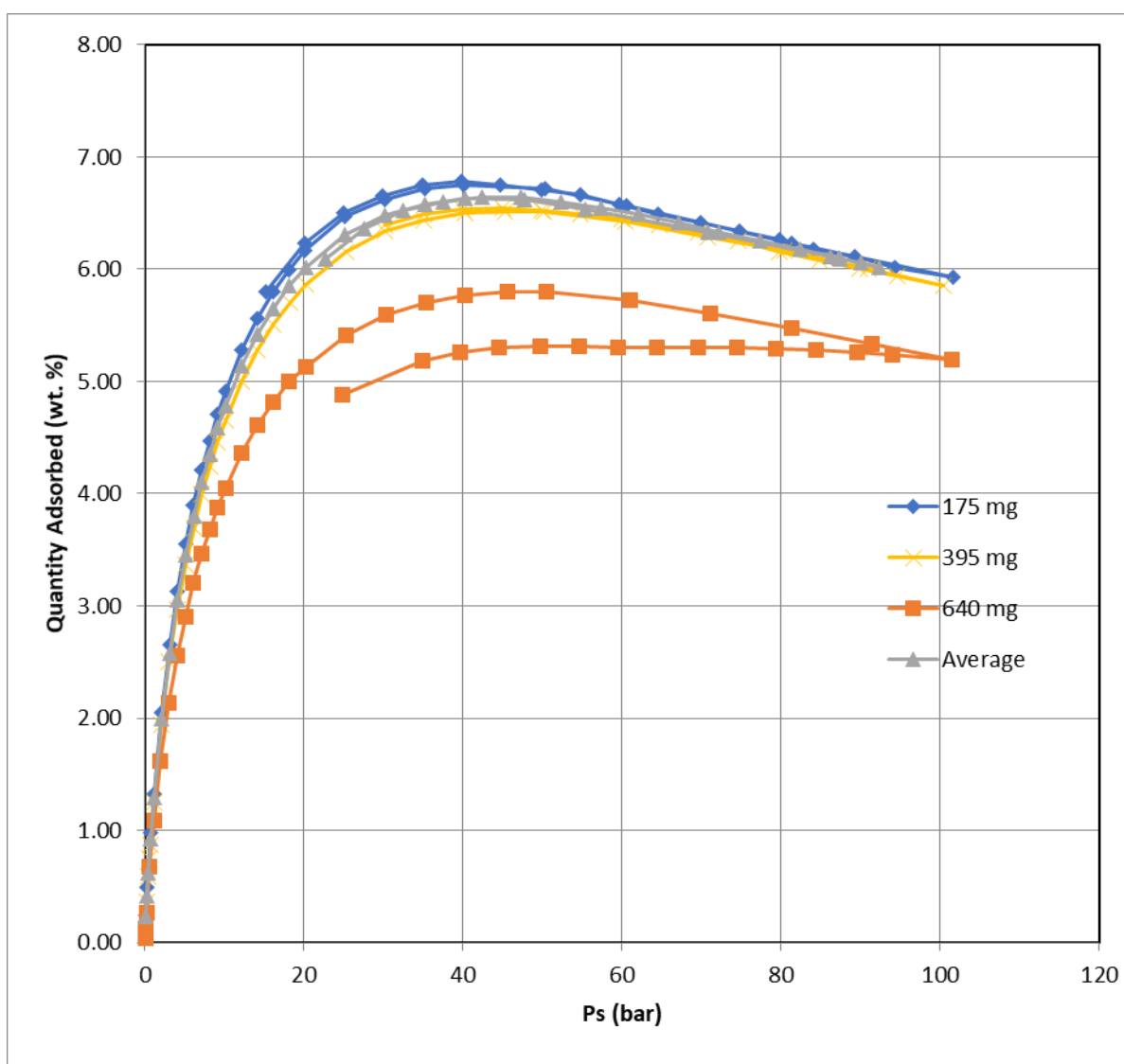


Figure S15. hydrogen adsorption-desorption isotherms at 77 K of different amounts of material MOF-177. Sample "Average" averages the measurements for 175 mg (779 m²) and 395 mg of material (1756 m²).

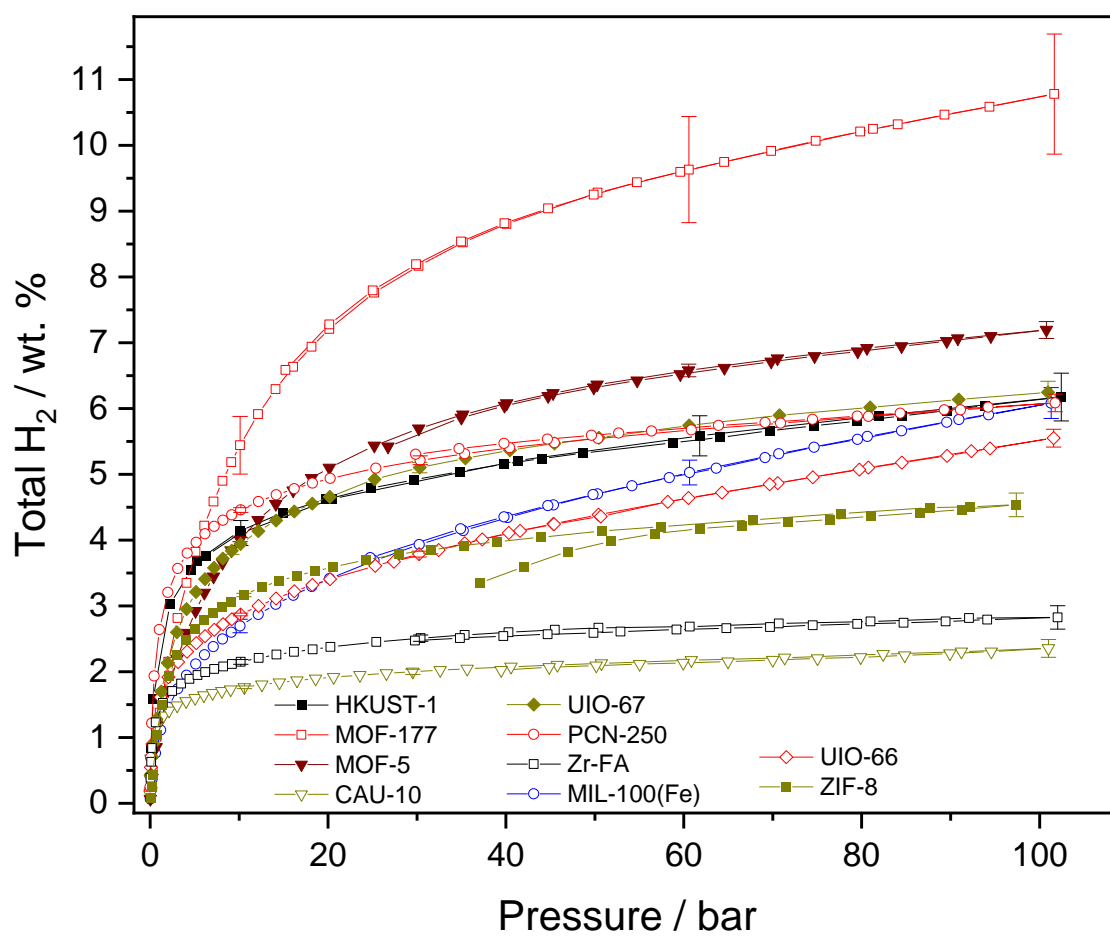


Figure S16. Gravimetric total hydrogen adsorption-desorption isotherms for MOFs at 77 K.



Figure S17. Measurement of the sample's volume into the HPVA analysis cell.

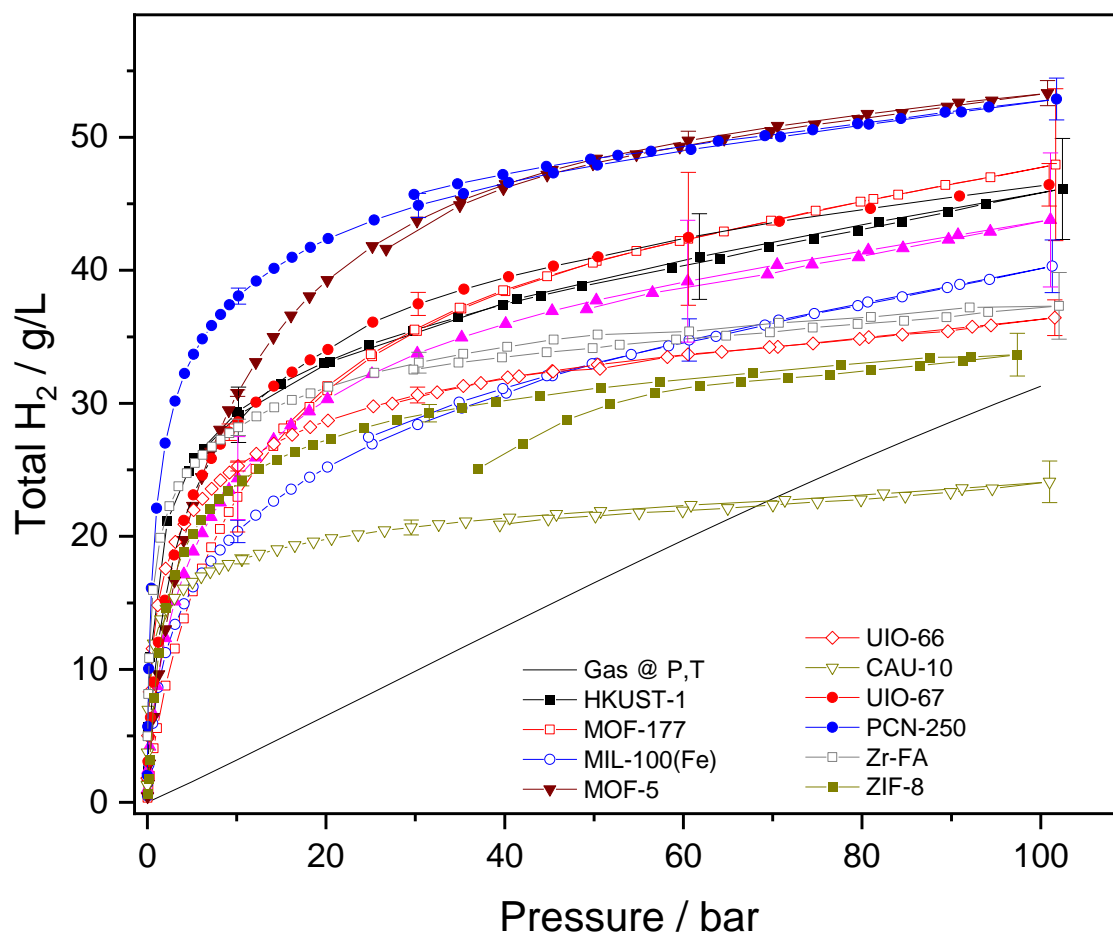


Figure S18. Maximum volumetric total hydrogen adsorption-desorption uptake of analyzed MOFs at 77 K considering the measured density of the crystals.