

Electronic supporting information

for paper

Tuning the gate-opening pressure and particle size distribution of the switchable metal-organic framework DUT-8(Ni) by controlled nucleation in a micromixer

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1. Schemes and photos of the experimental setup.

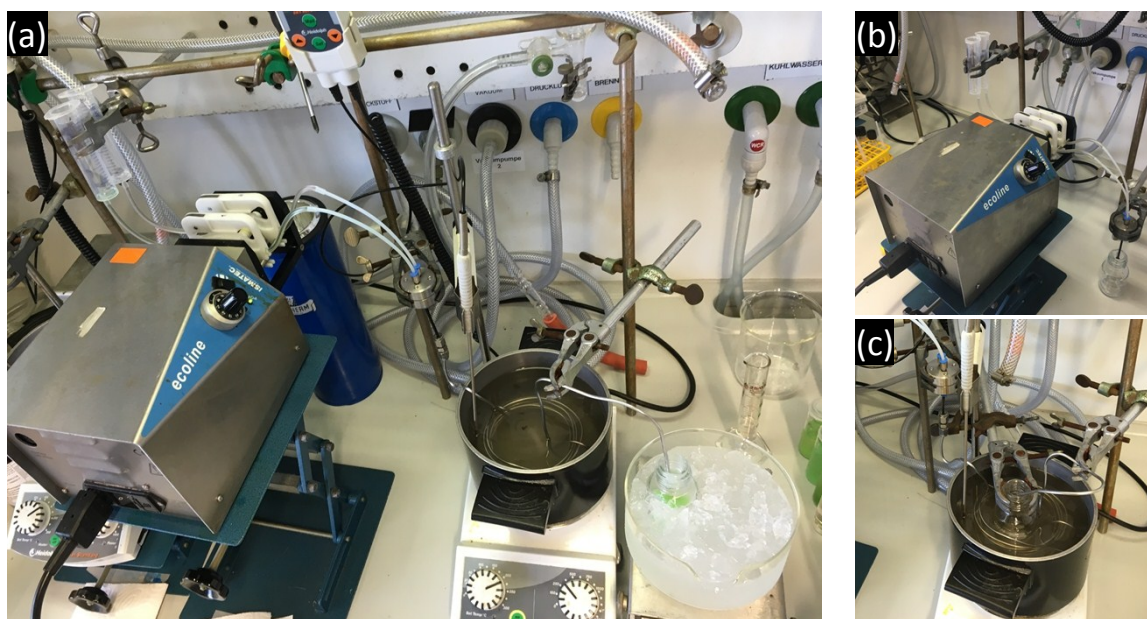


Figure S1. Photograph of experimental system using micromixer for the synthesis of samples: (a) **m1**, (b) **m2** and (c) **m3-m8**.

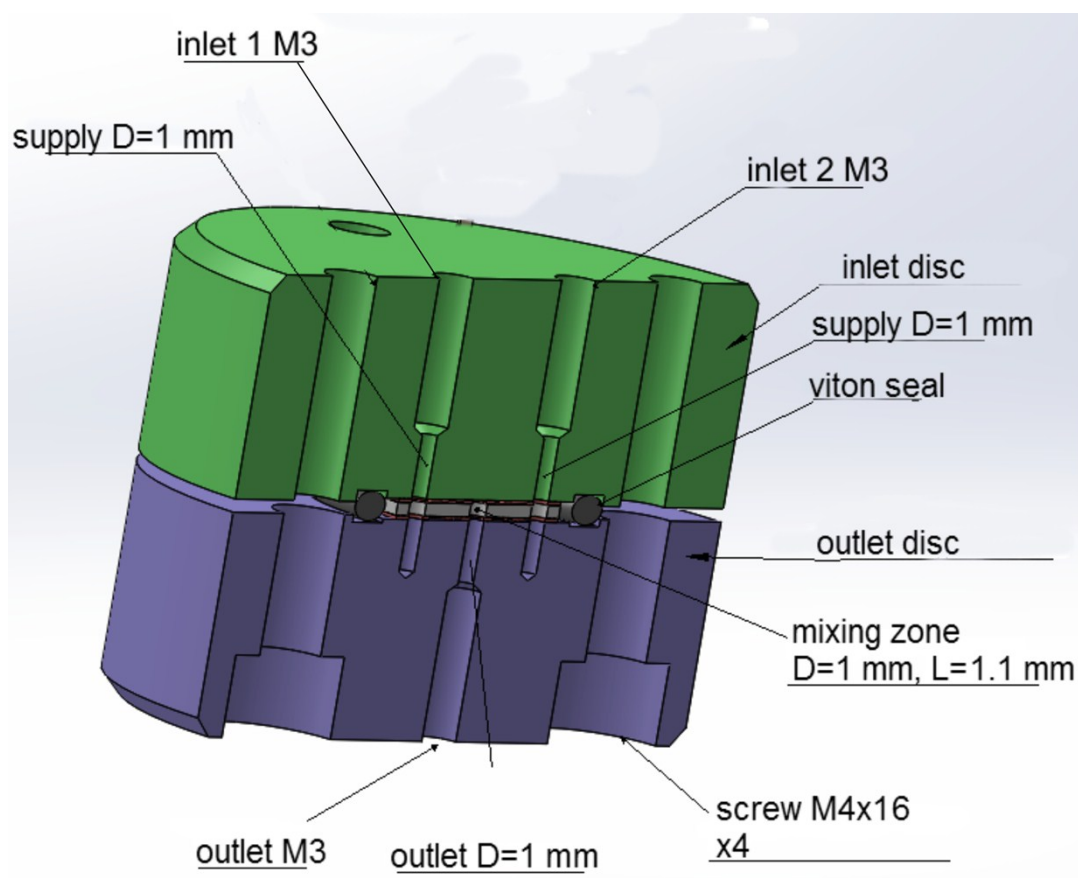


Figure S2. Schematic representation of the micromixer

2. Villiermaux-Dushman method

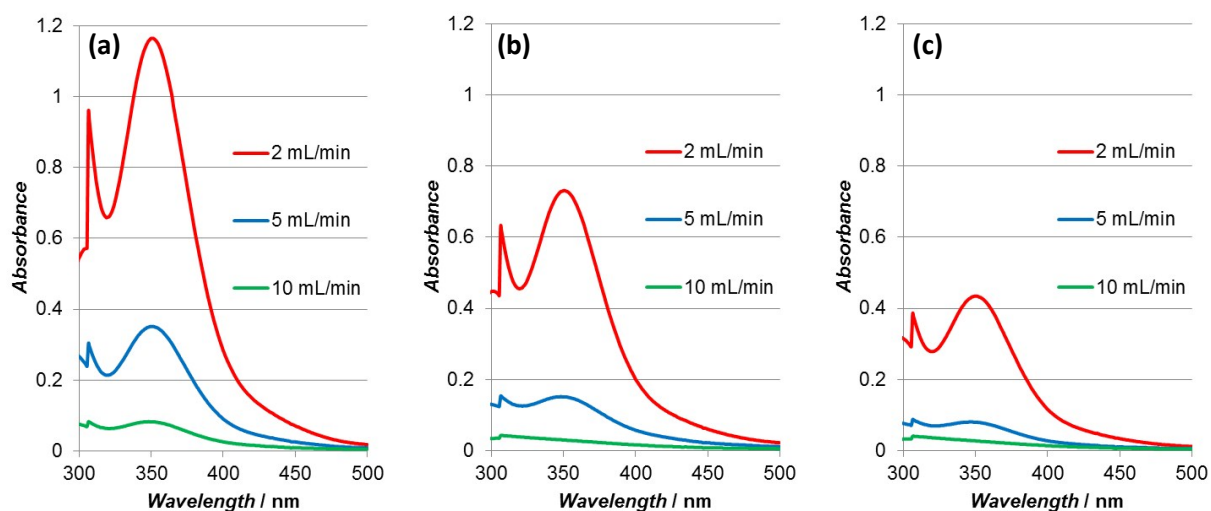


Figure S3. UV-Vis spectra for resulting solution of the (a) set 1, (b) set 2 and (c) set 3 by Villiermaux-Dushman reaction

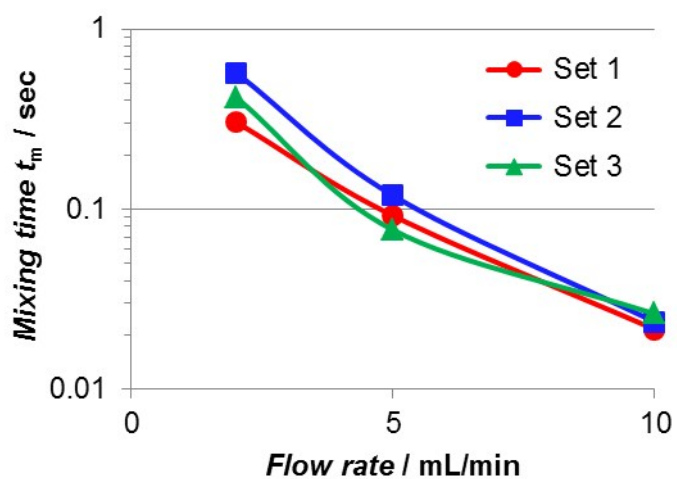


Figure S4. Dependence of the characteristic mixing time t_m on the flow rate for the micromixer.

Table S1. Concentration sets for Villiermaux-Dushman reaction

C					
(mol/L)	[H ⁺]	[KI]	[KIO ₃]	[NaOH]	[H ₃ BO ₃]
Set 1	0.02	0.032	0.006	0.09	0.09
Set 2	0.015	0.016	0.003	0.045	0.045
Set 3	0.015	0.032	0.006	0.09	0.09

3. PXRD patterns

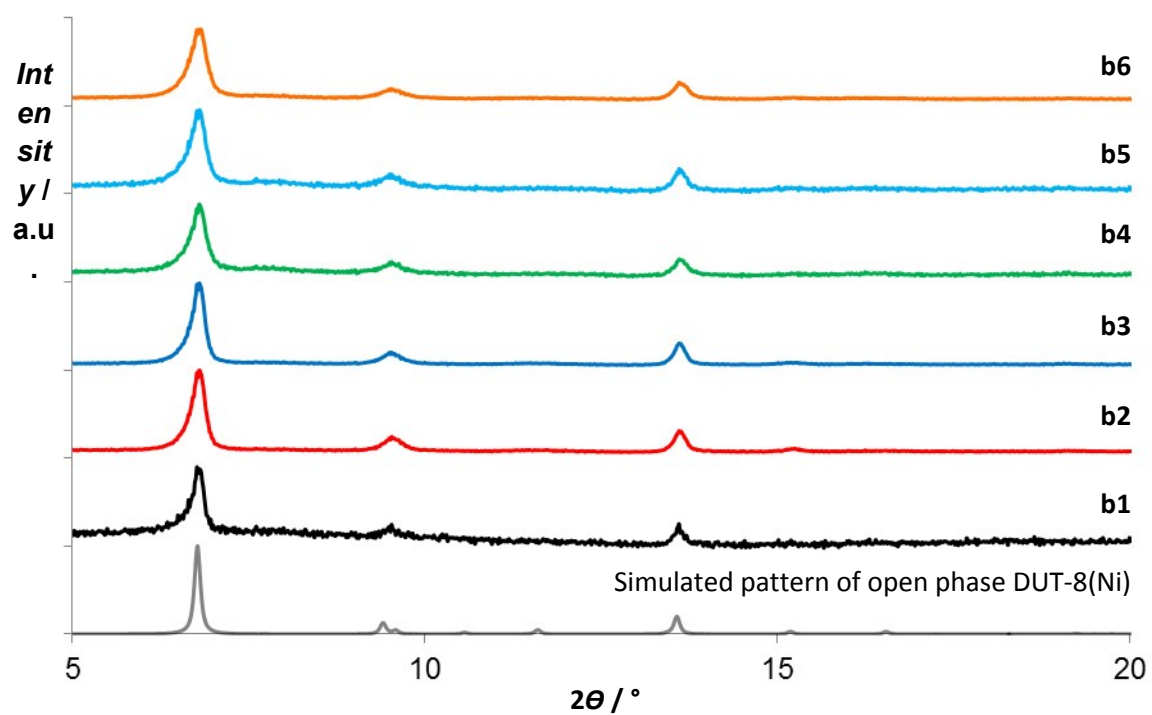


Figure S5. PXRD patterns for activated DUT-8(Ni) samples, synthesized in batch using different ratio of reactants and the order of mixing (**b1**, **b2**, **b3**, **b4**, **b5** and **b6**).

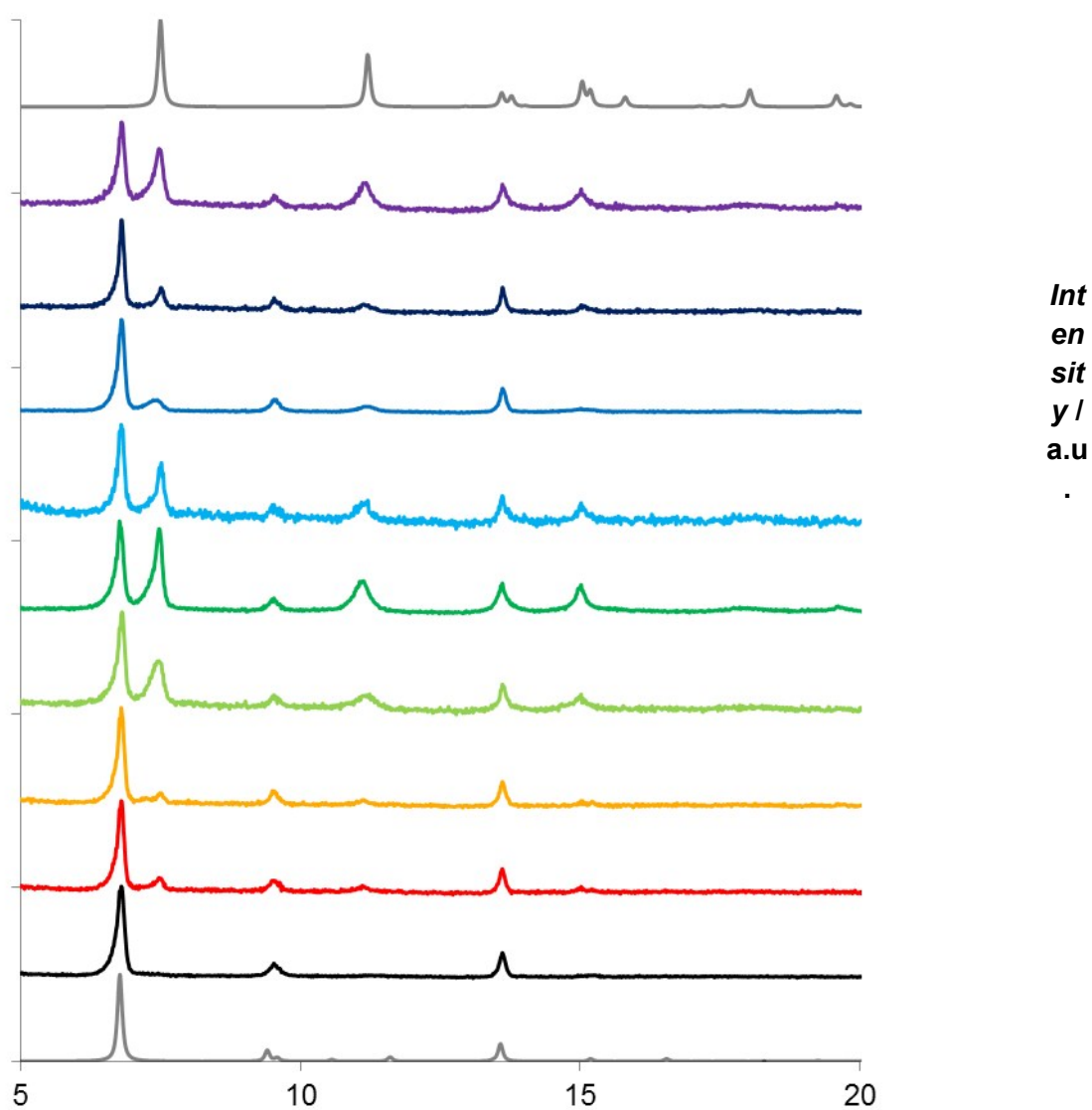


Figure S6. PXRD patterns for activated DUT-8(Ni) samples, synthesized by batch synthesis procedures at different temperatures (**b7**, **b8**, **b9**, **b10**, **b11**, **b12**, **b13**, **b14** and **b15**).

4. Nitrogen physisorption isotherms

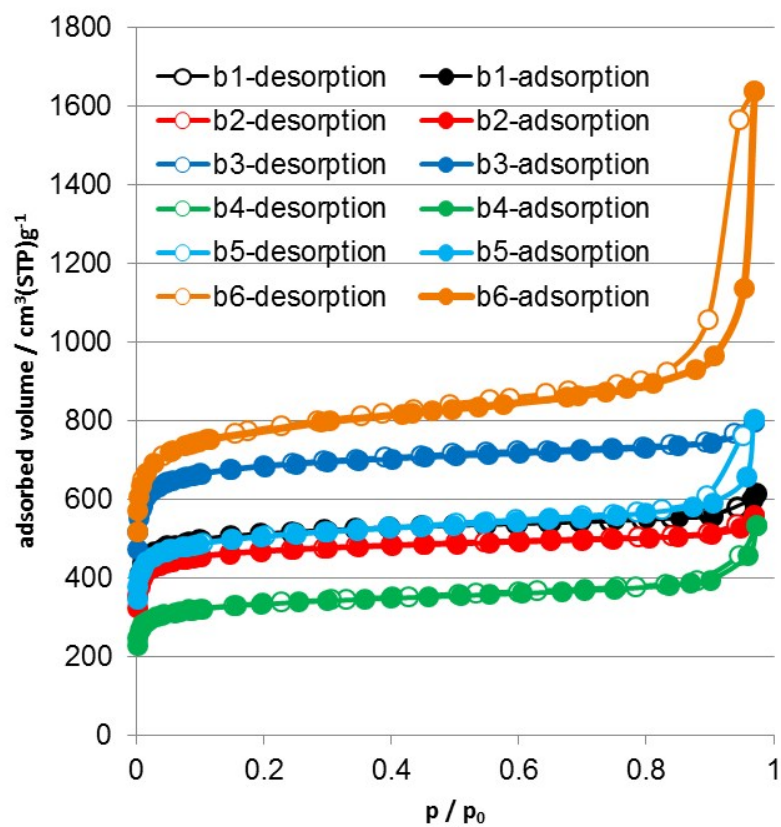


Figure S7. Nitrogen physisorption isotherms for samples **b1** – **b6** measured at 77 K.

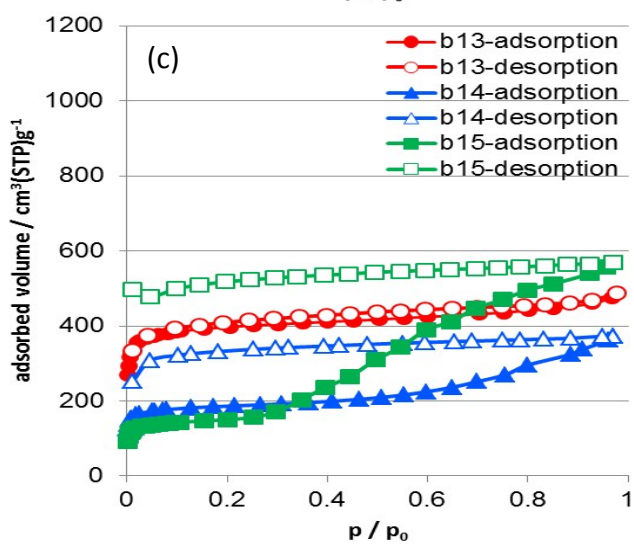
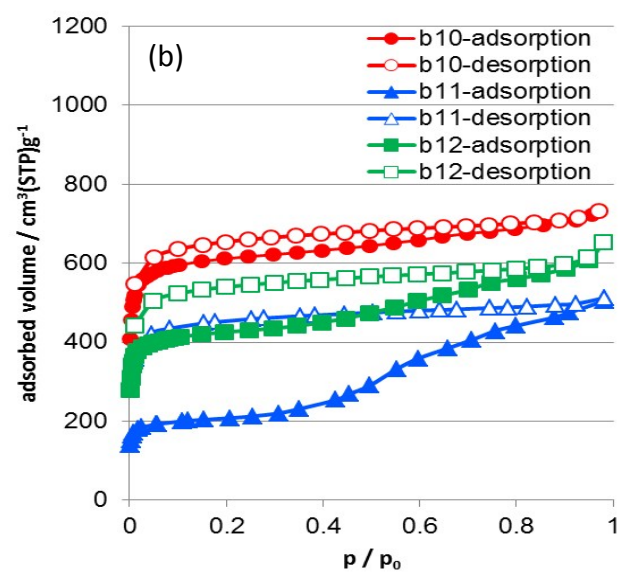
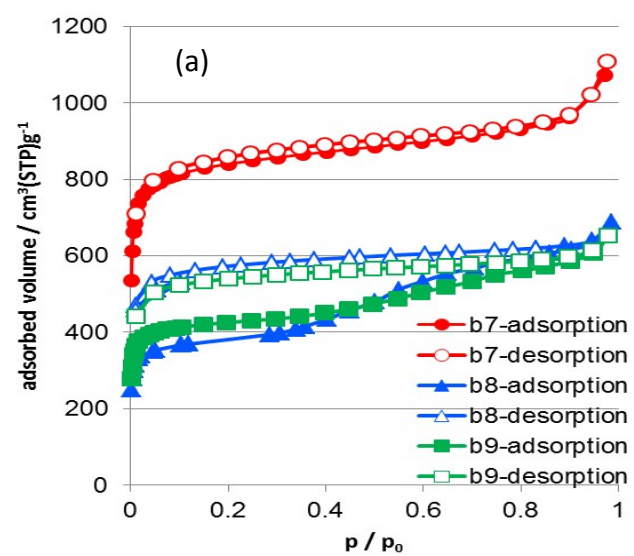
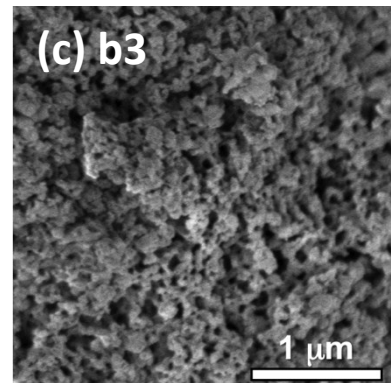
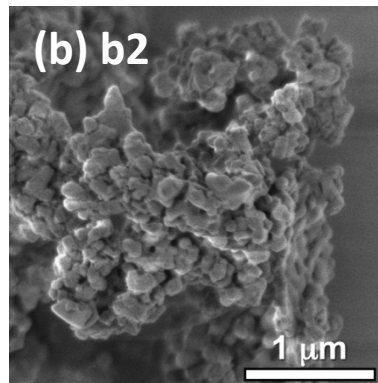
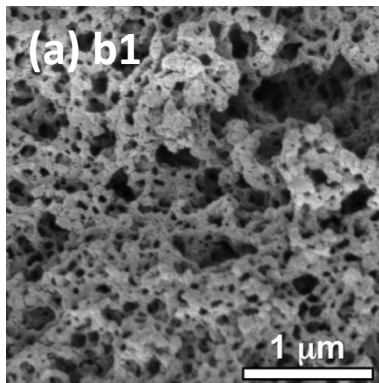


Figure S8. Nitrogen physisorption isotherms for (a) **b7 – b9**, (b) **b10 – b12** and (a) **b13 – b15** measured at 77 K.

5. Scanning electron microscopy



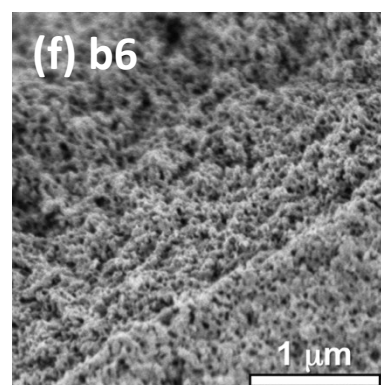
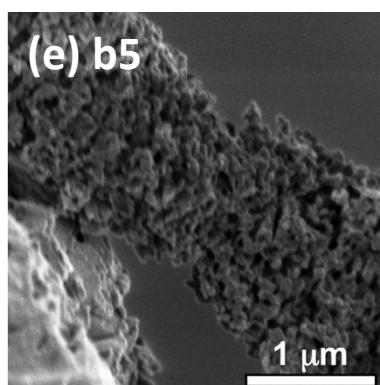
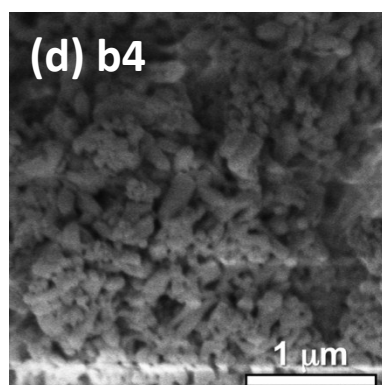


Figure S9. SEM images for samples b1-b6.

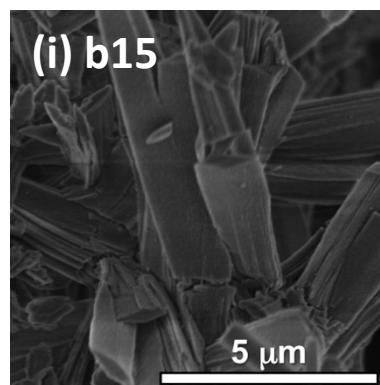
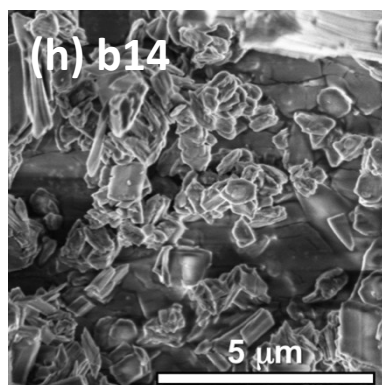
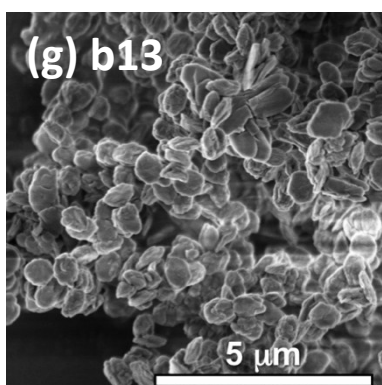
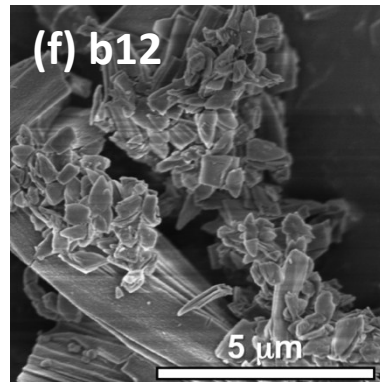
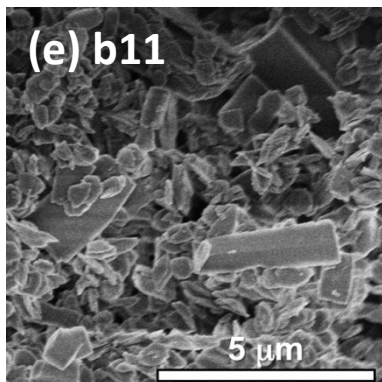
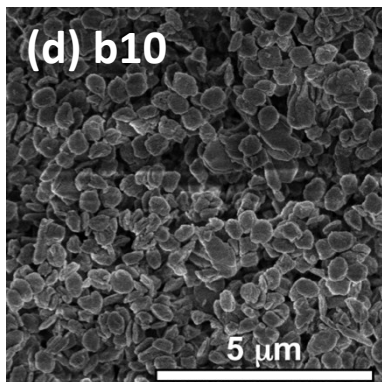
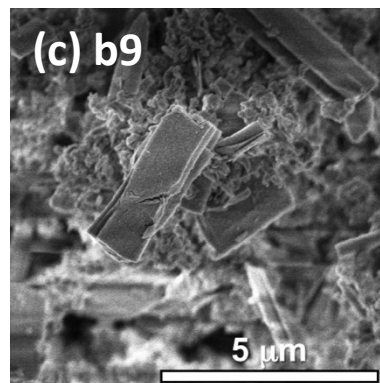
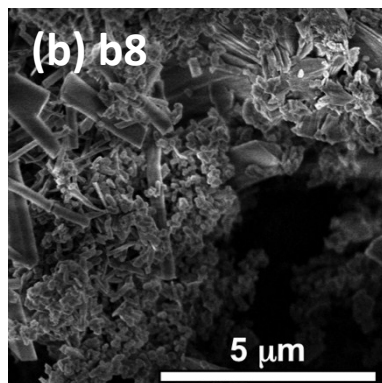
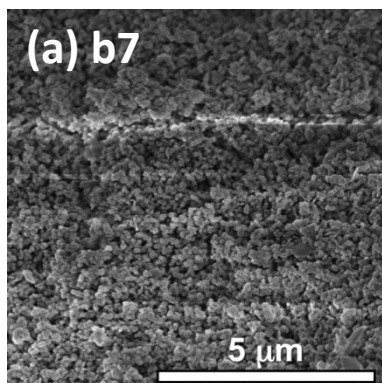


Figure S10. SEM images for samples b7-b15.

6. DRIFT spectra

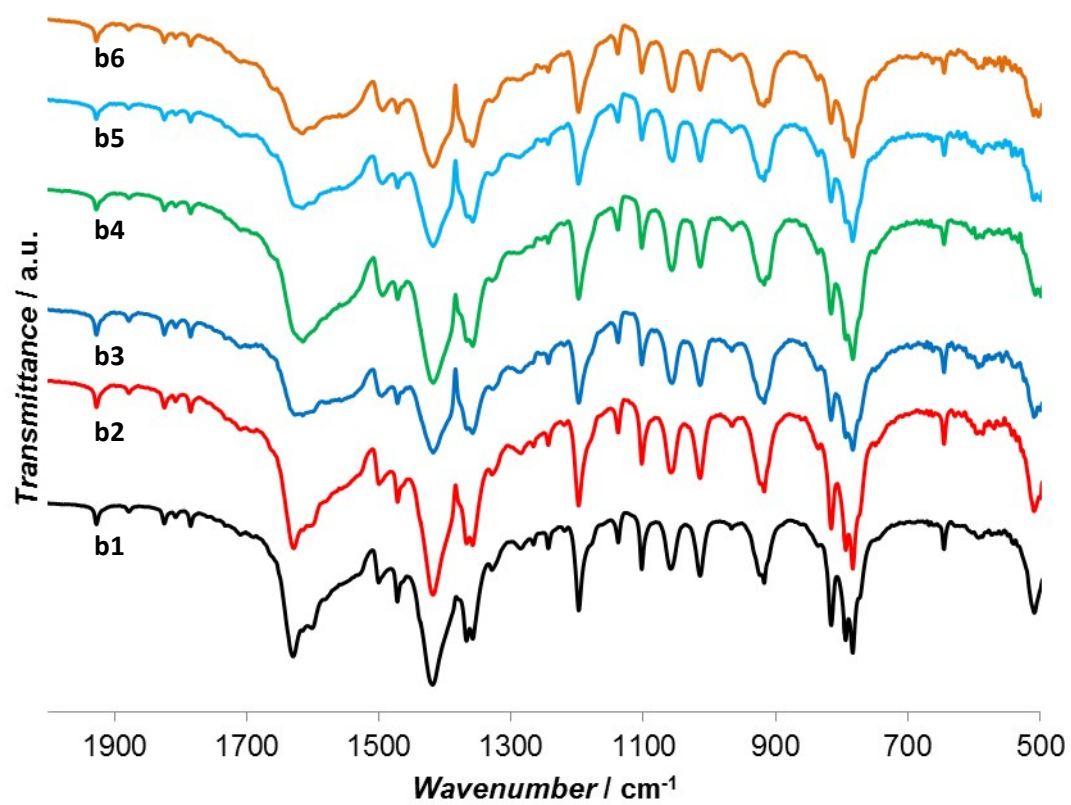


Figure S11. DRIFT spectra for samples **b1**- **b6**.

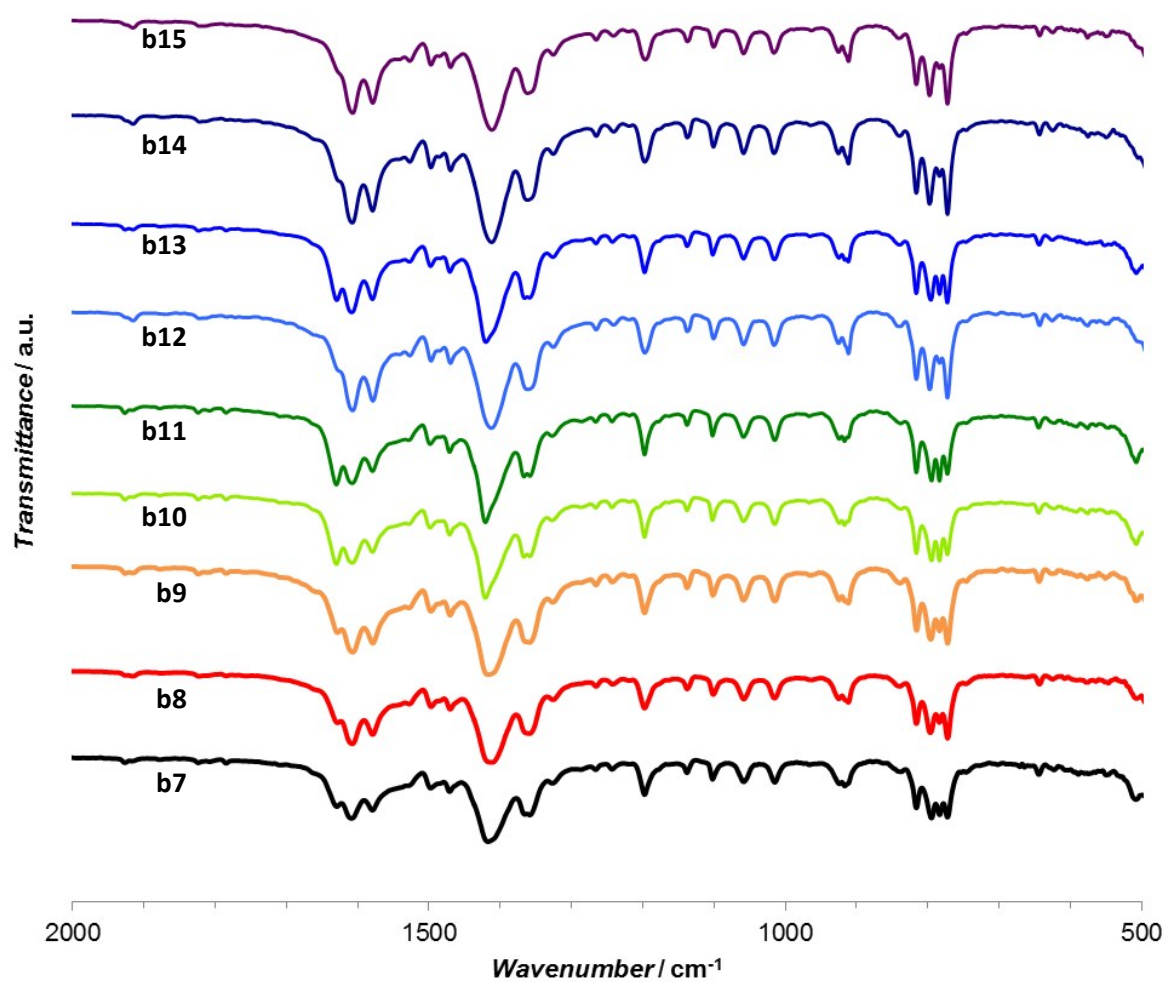


Figure S12. DRIFT spectra for samples **b7- b15**.

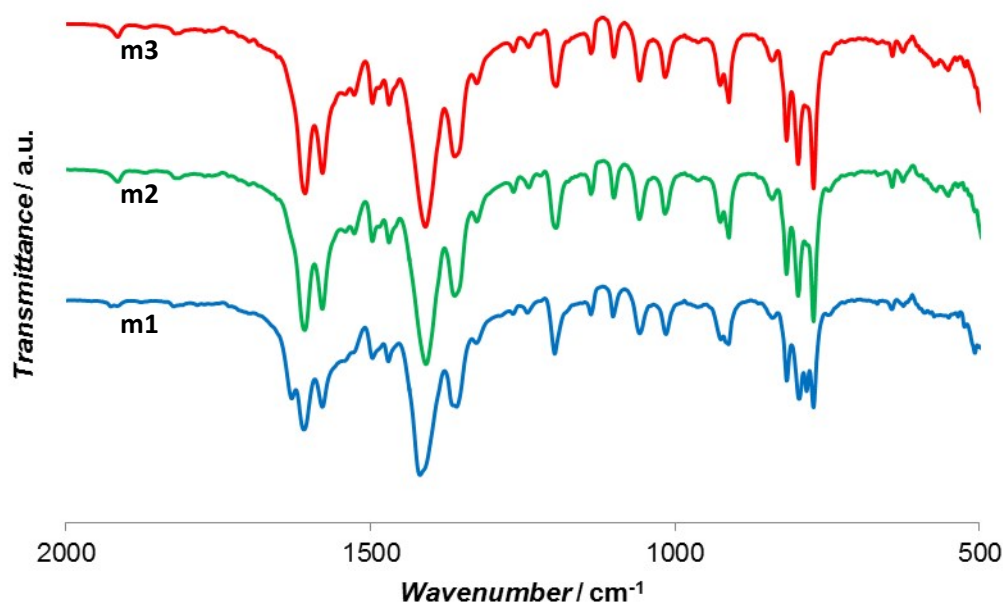


Figure S13. DRIFT spectra for samples **m1**, **m2** and **m3**.

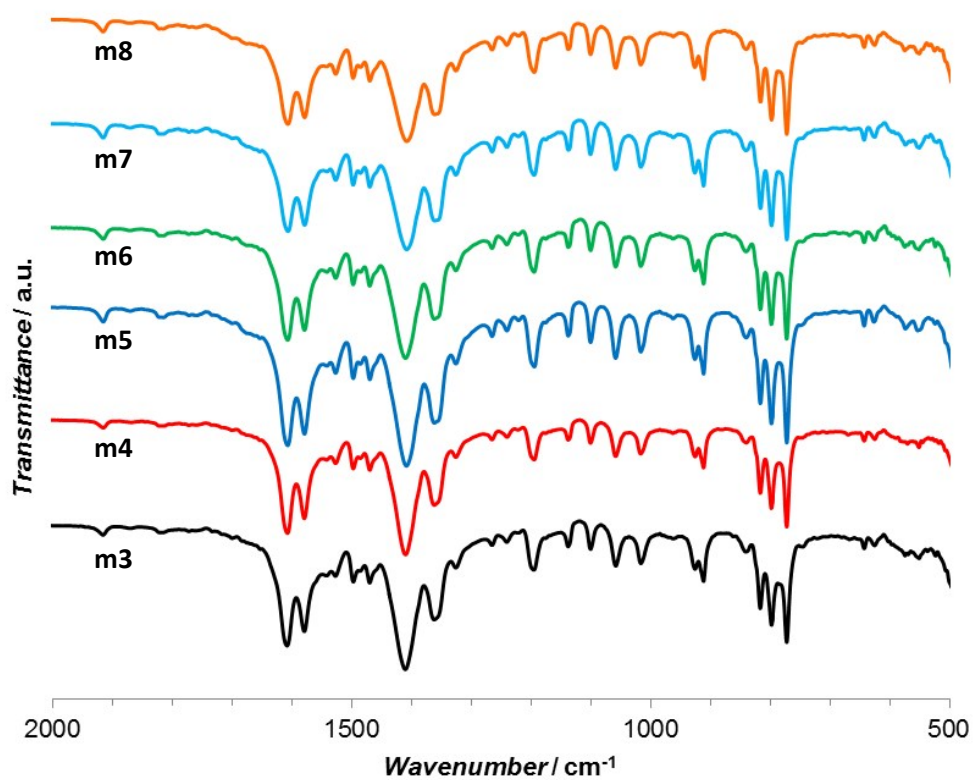


Figure S14. DRIFT spectra for samples **m3- m8**.

7. TG curves

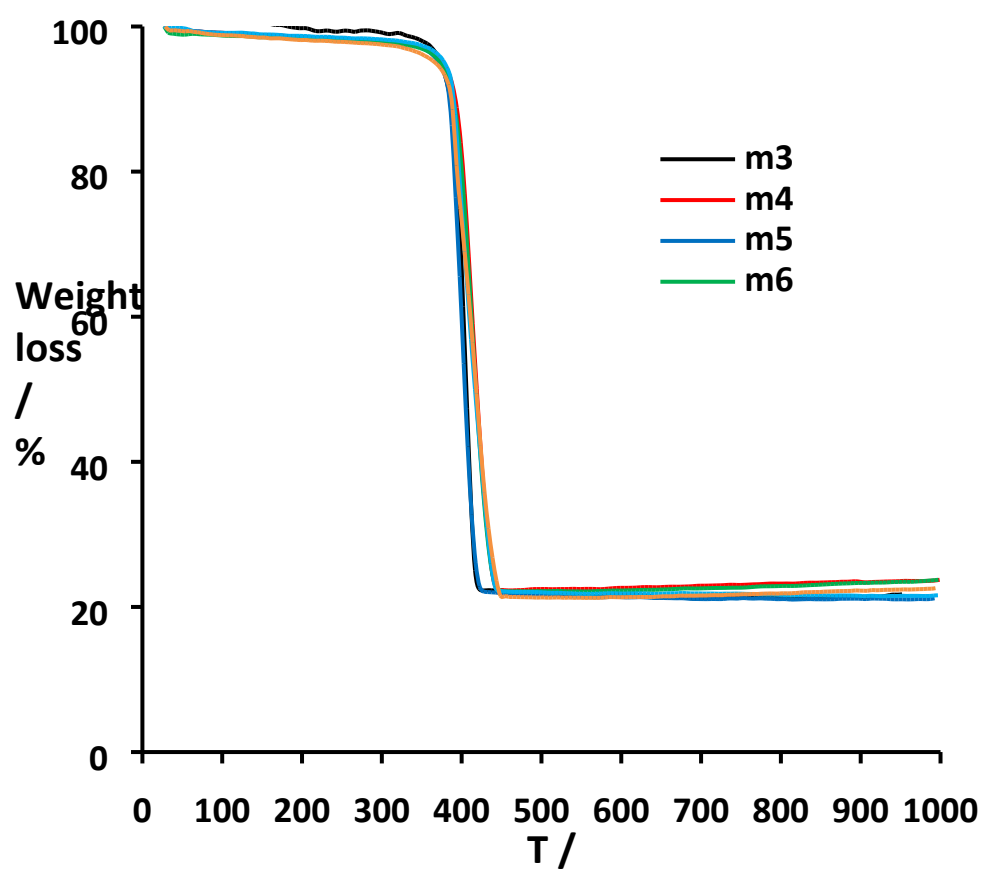


Figure S15. TG curves for samples m3-m8.