

## Supplementary Information

### Shape Control of Zn(II) Metal-Organic Frameworks by Modulation Synthesis and Their Morphology-Dependent Catalytic Performance

Mohammad Yaser Masoomi, Saeideh Beheshti and Ali Morsali\*

Department of Chemistry, Faculty of Sciences, TarbiatModares University, P.O. Box 14115-  
175, Tehran, Islamic Republic of Iran

Email: [Morsali\\_a@modares.ac.ir](mailto:Morsali_a@modares.ac.ir), [Morsali\\_a@yahoo.com](mailto:Morsali_a@yahoo.com)

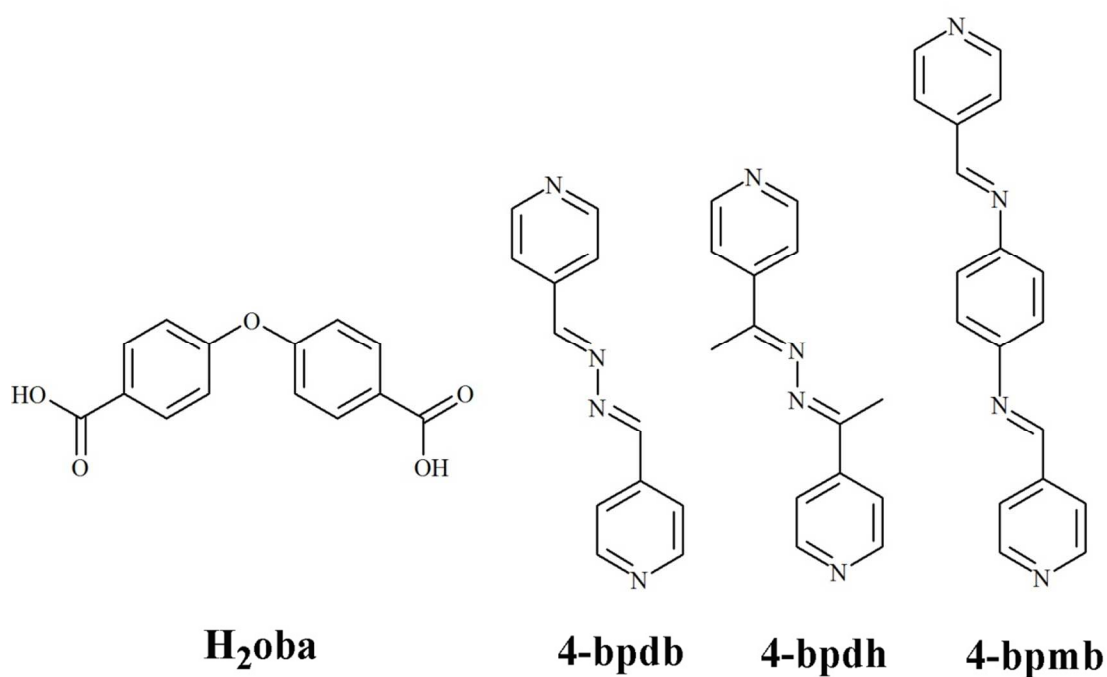


Figure S1. Chemical structure of H<sub>2</sub>oba, 4-bpdb, 4-bpdh and 4-bpmb.

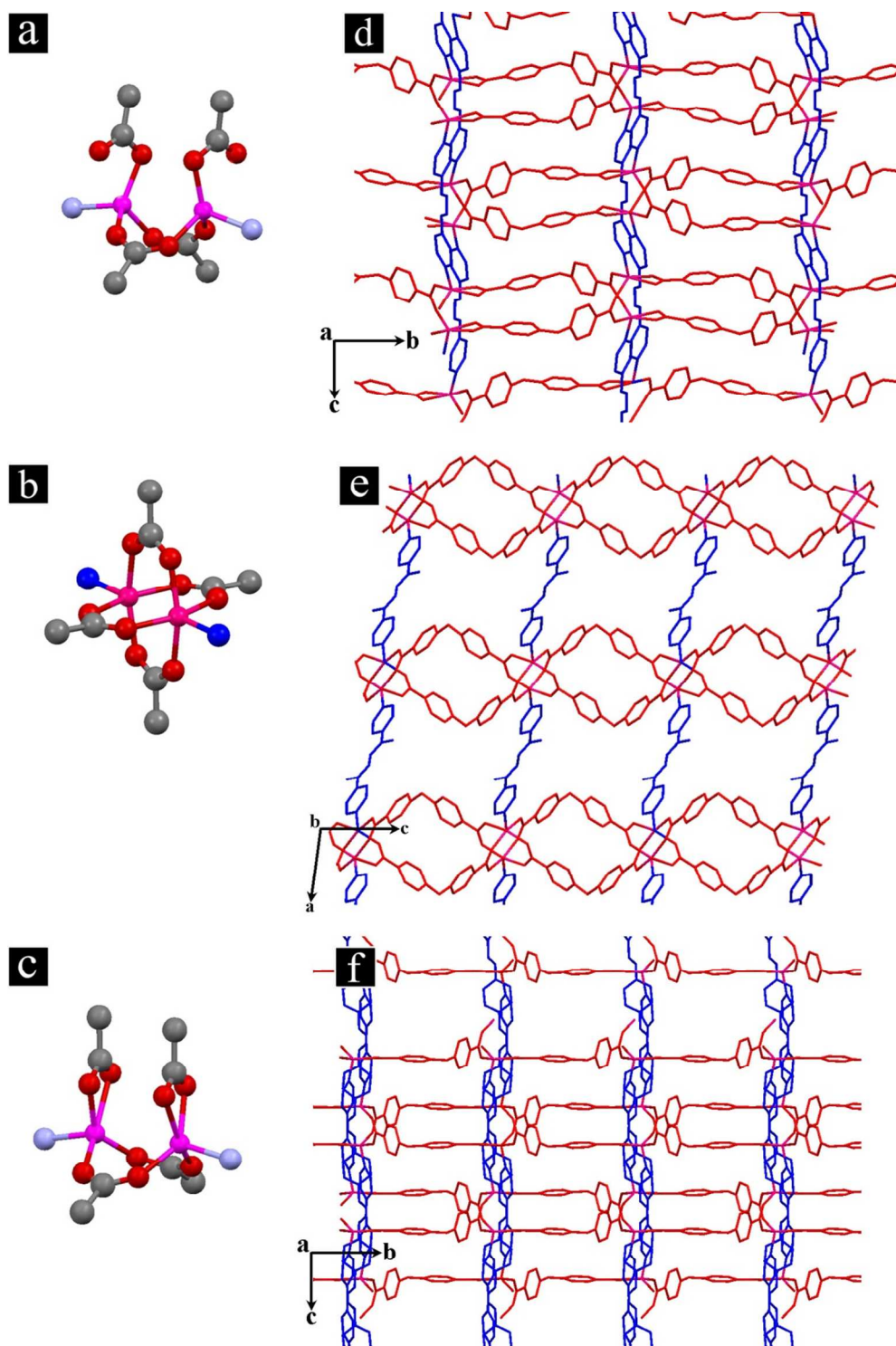


Figure S2. Representation of binuclear  $Zn_2$  units in (a) TMU-4, (b) TMU-5 and (c) TMU-6. Layers of  $Zn(II)$ -oba (in red) pillared by N-donor ligand (in blue), (d) 4-bpdb in TMU-4, (e) 4-bpdh in TMU-5 and (f) 4-bpmb in TMU-6.

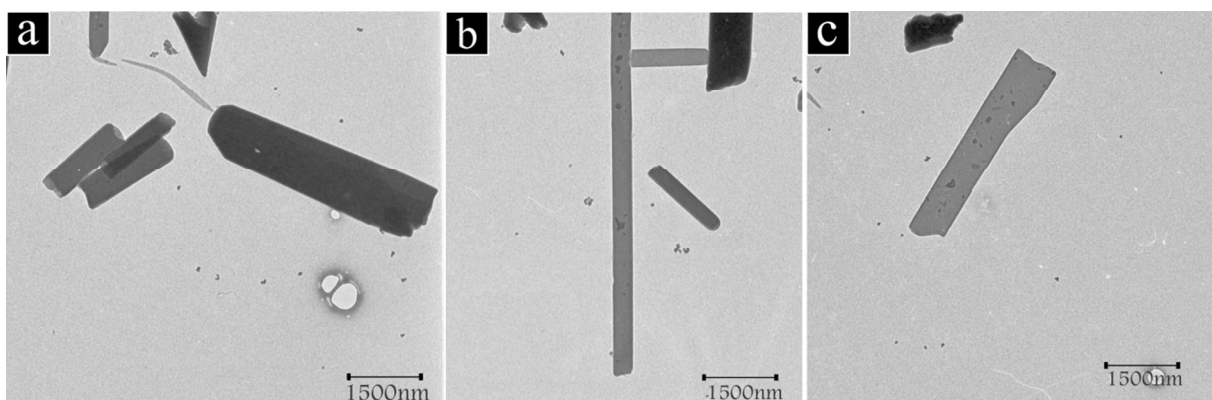


Figure S3. (a-c) TEM images of TMU-5 which shown in Figure 1d;  $r = 2$ ,  $T = 100\text{ }^{\circ}\text{C}$ , 24h;  $r$  represents the ratio between acetic acid and oba. The concentration of oba is  $c = 0.025\text{ M}$ .

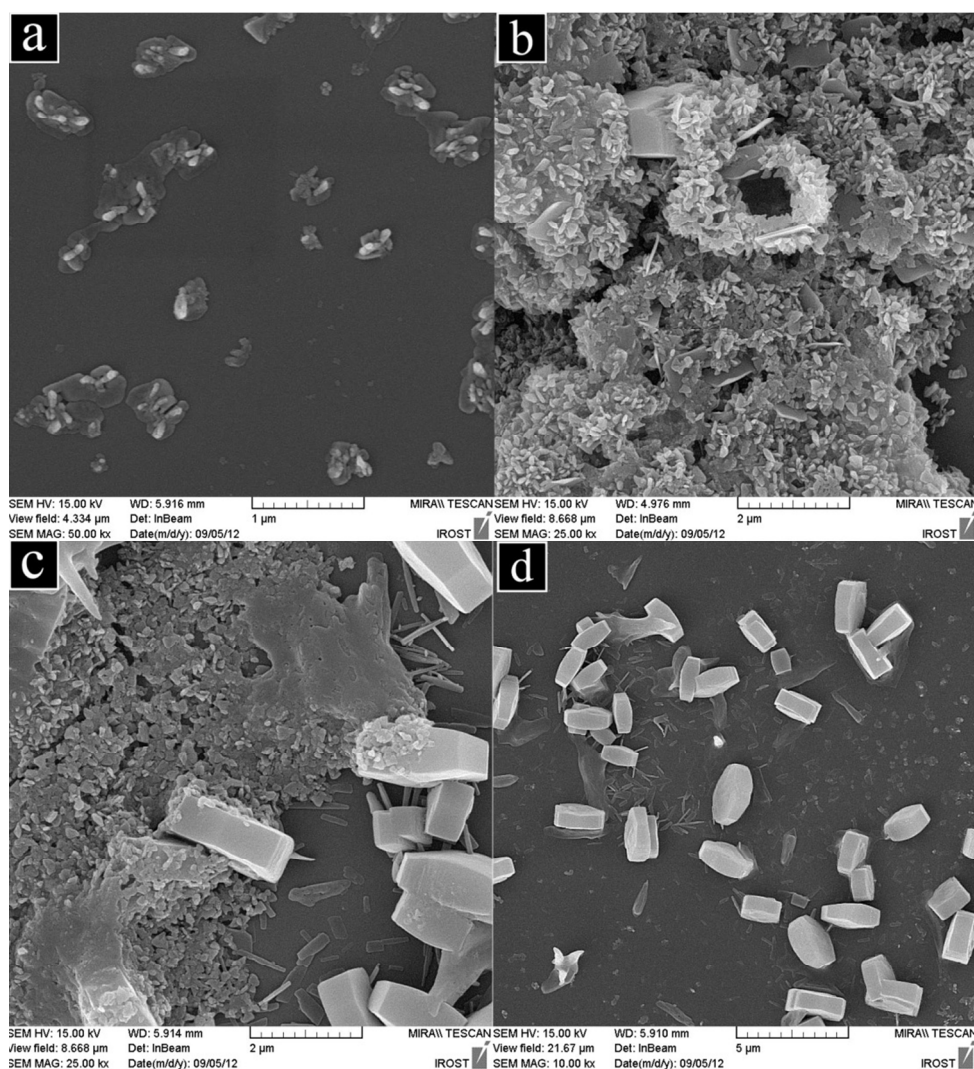


Figure S4. Time dependent FE-SEM images of TMU-5 micro-plates that was obtained under conditions of  $r = 30$ ,  $T = 100\text{ }^{\circ}\text{C}$ , after (a) 2 h (b) 15 h, (c) 20 h and (d) 24 h.

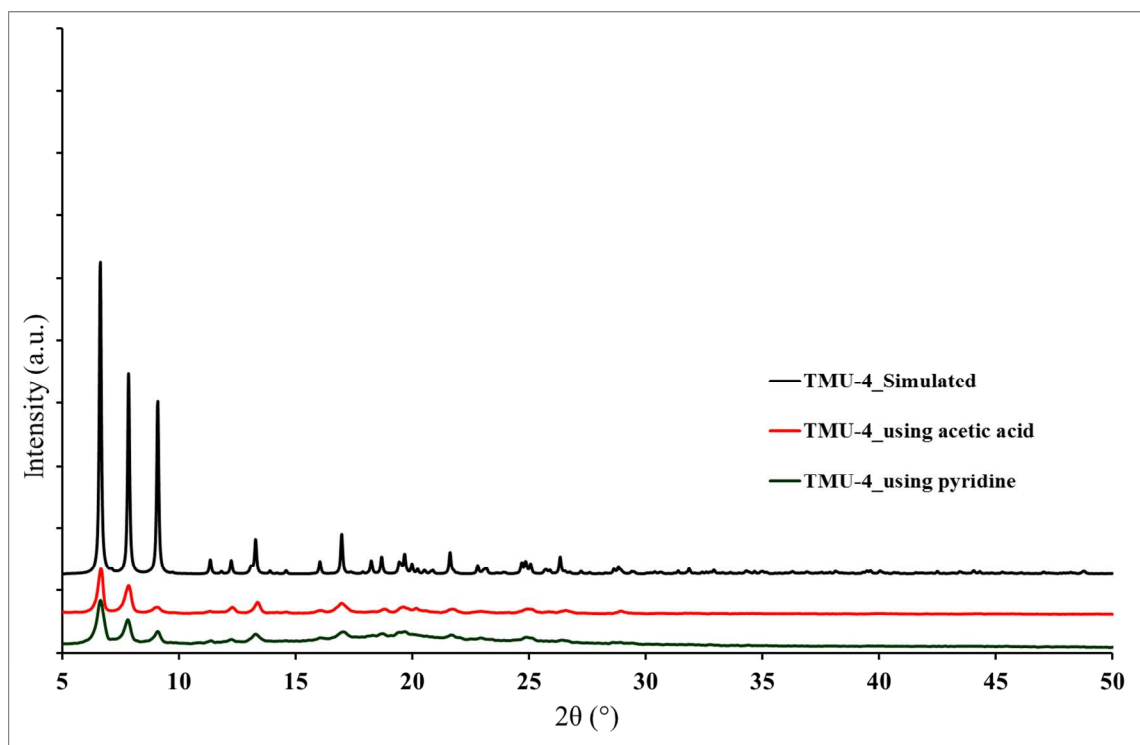


Figure S5. Powder X-ray diffraction patterns of TMU-4. While using acetic acid conditions are  $r = 10$ ,  $T = \text{RT}$ , 24h and when using pyridine conditions are  $r = 10$ ,  $T = \text{RT}$ , 2 h.

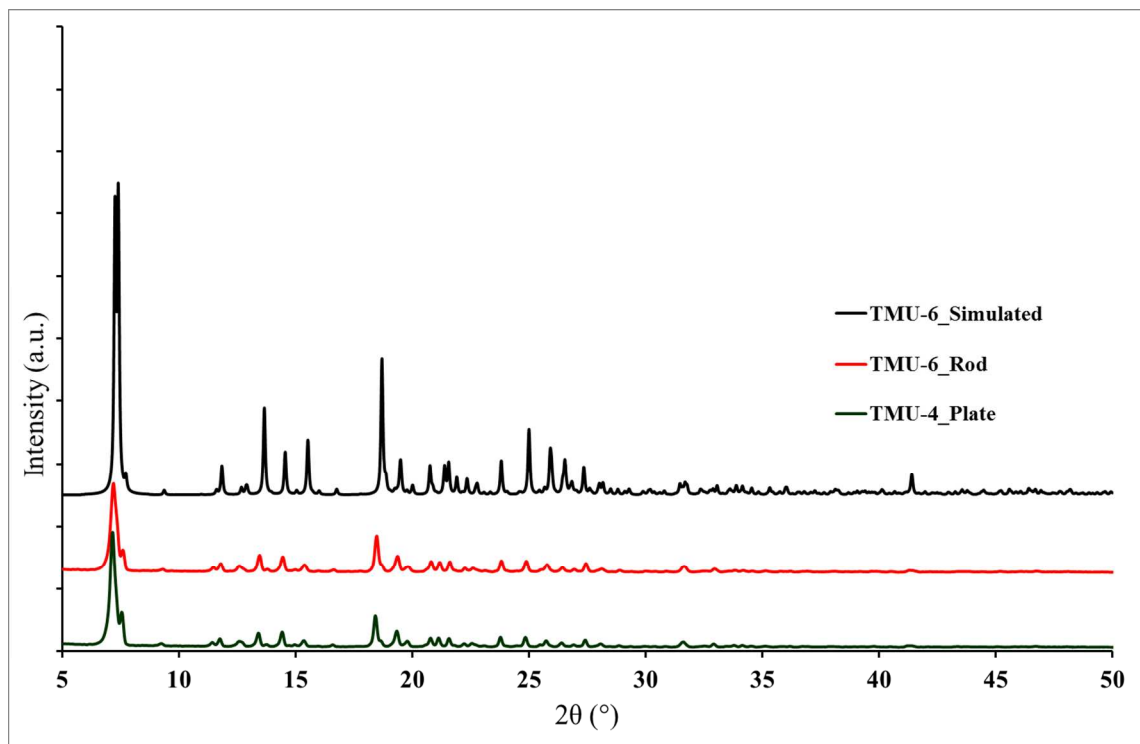


Figure S6. Powder X-ray diffraction patterns of TMU-6. For rod-shaped conditions are  $r = 1$ ,  $T = \text{RT}$ , 24h and for plate-shaped conditions is  $r = 1$ ,  $T = \text{RT}$ , 24h.

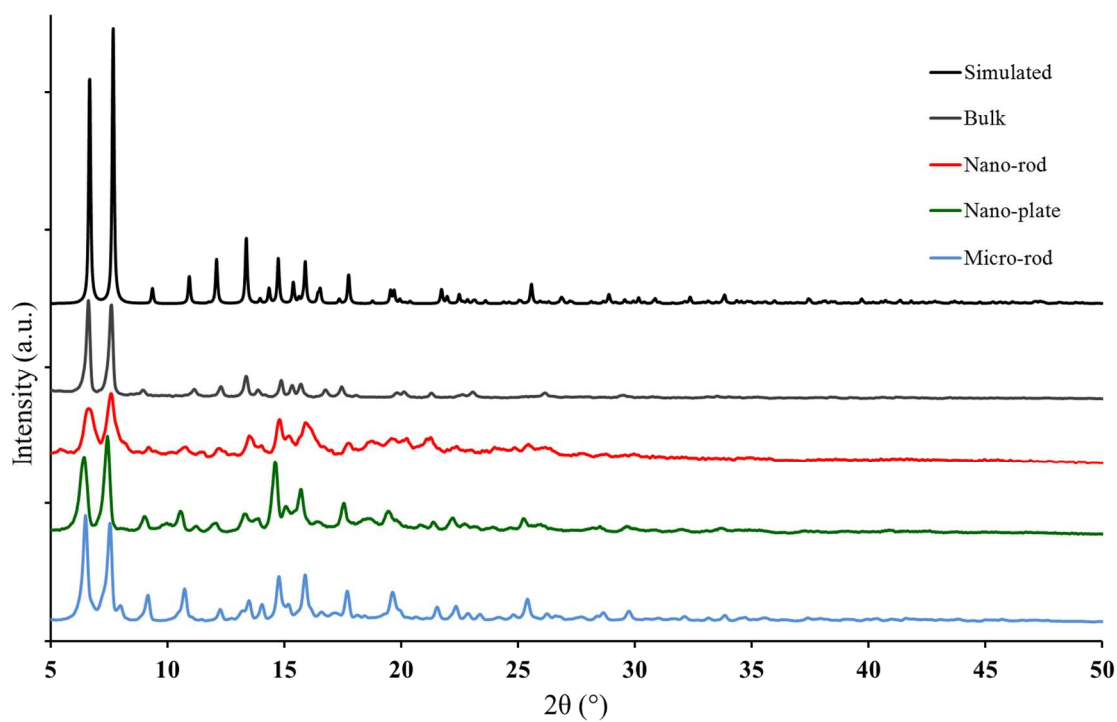


Figure S7. Powder X-ray diffraction patterns of TMU-5's simulated, bulk, nano-rod, nano-plate and micro-rod after 4 successive runs.

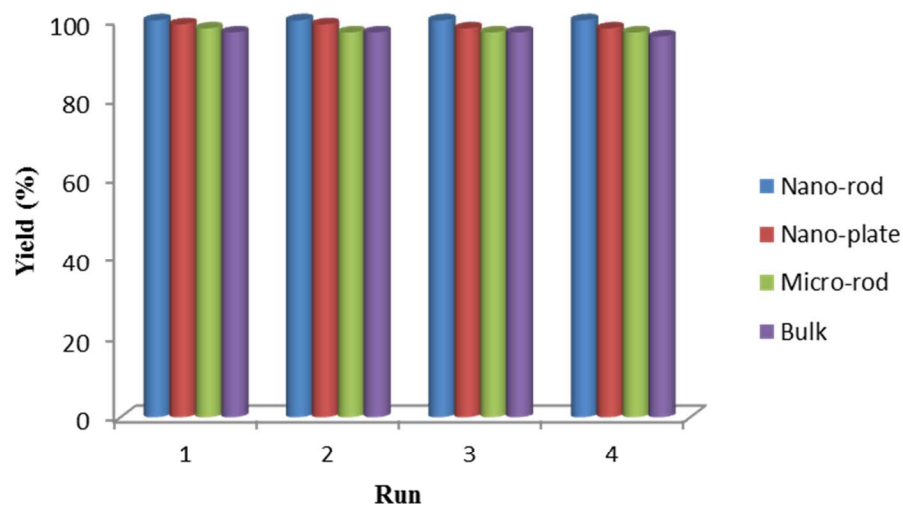


Figure S8. Recyclability of TMU-5 morphologies after 4 successive runs.

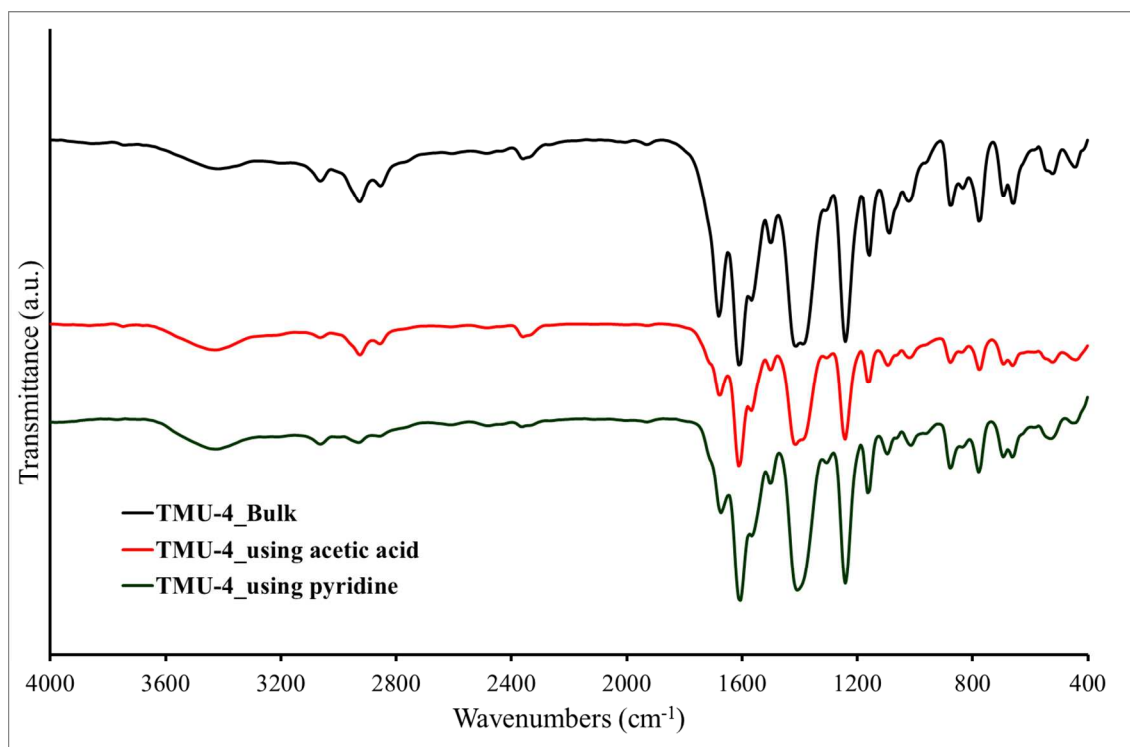


Figure S9. IR spectra of TMU-4 bulk, upon using acetic acid ( $r = 10$ ,  $T = \text{RT}$ , 24h) and upon using pyridine ( $r = 10$ ,  $T = \text{RT}$ , 2 h).

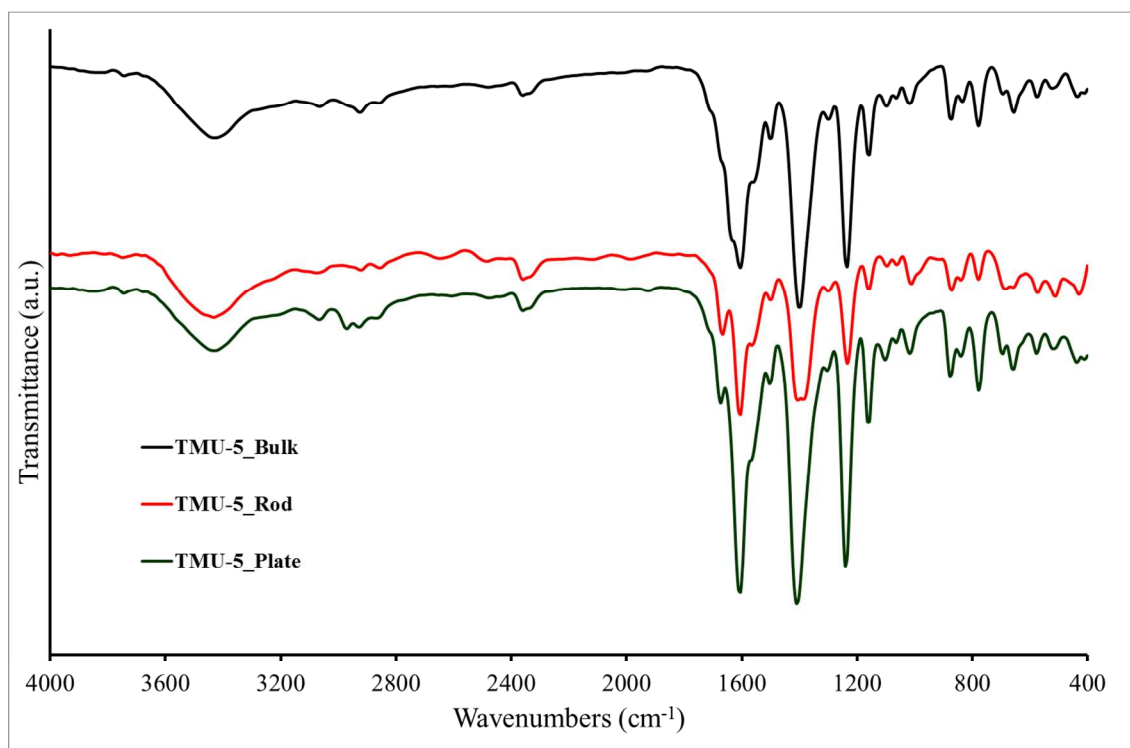


Figure S10. IR spectra of TMU-5 bulk, rod-shaped ( $r = 10$ ,  $T = 100\text{ }^{\circ}\text{C}$ , 24h) and plate-shaped morphology ( $r = 10$ ,  $T = \text{RT}$ , 24h).

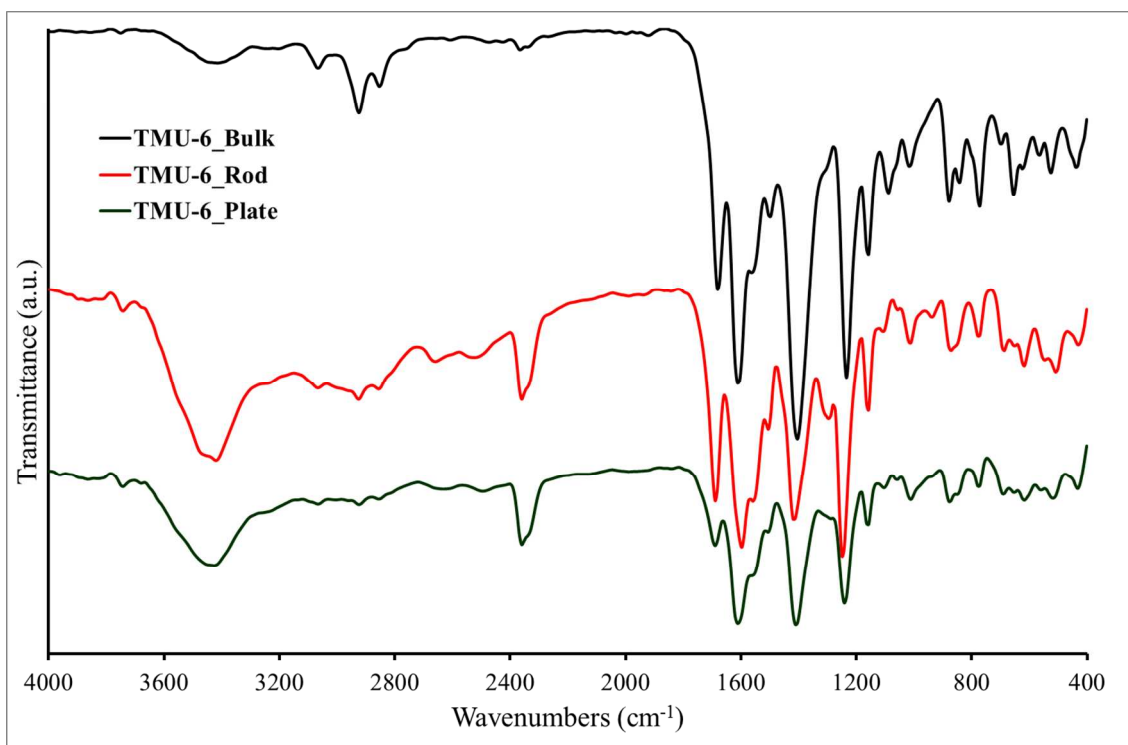


Figure S11. IR spectra of TMU-6 bulk, rod-shaped ( $r = 1$ ,  $T = \text{RT}$ , 24h) and plate-shaped morphology ( $r = 1$ ,  $T = \text{RT}$ , 24h).