Electronic Supplementary Material (ESI) for CrystEngComm.


**Supporting Information**

# Co(II) coordination polymers supported by benzenetetracarboxylate and bis-pyridyl-bis-amide with different flexibility

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**Fig. S1.** A drawing showing the 3D framework of **1**.

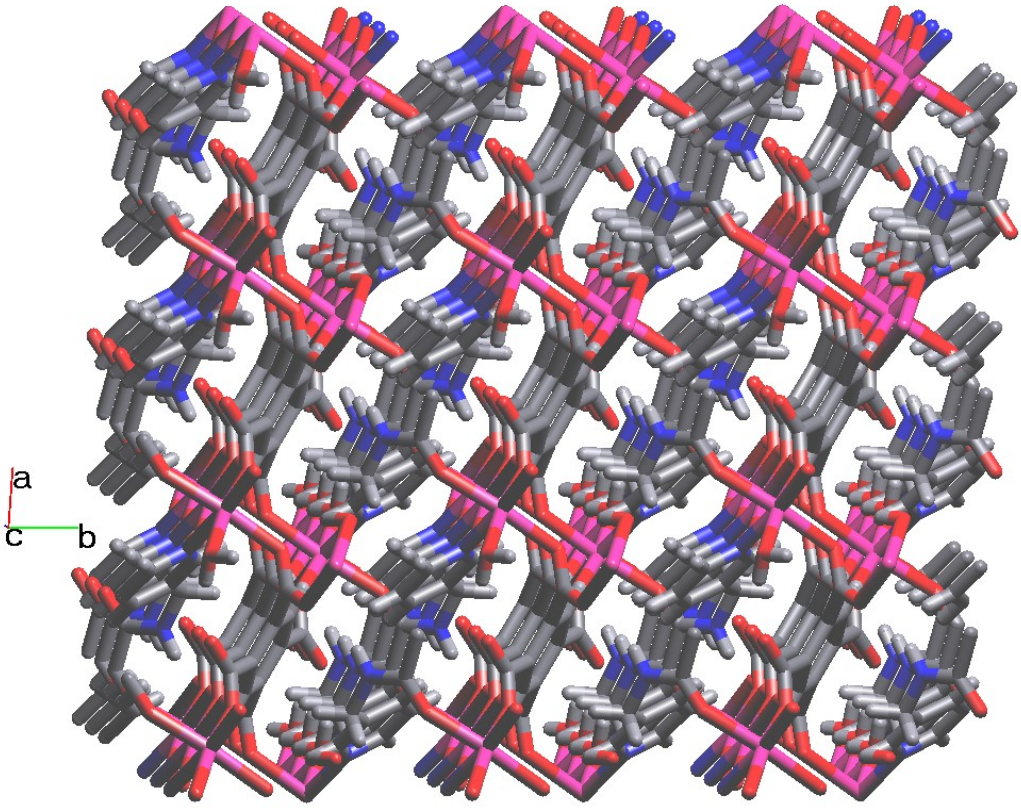

**Fig. S2.** A drawing showing the 2D layer of **2**.

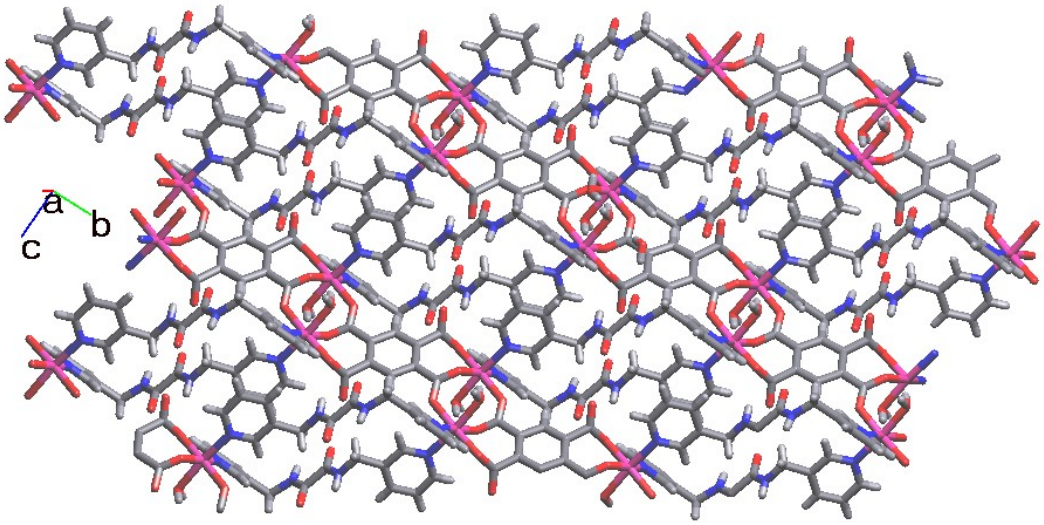

**Fig. S3.** A drawing showing the 3D framework of **3**.

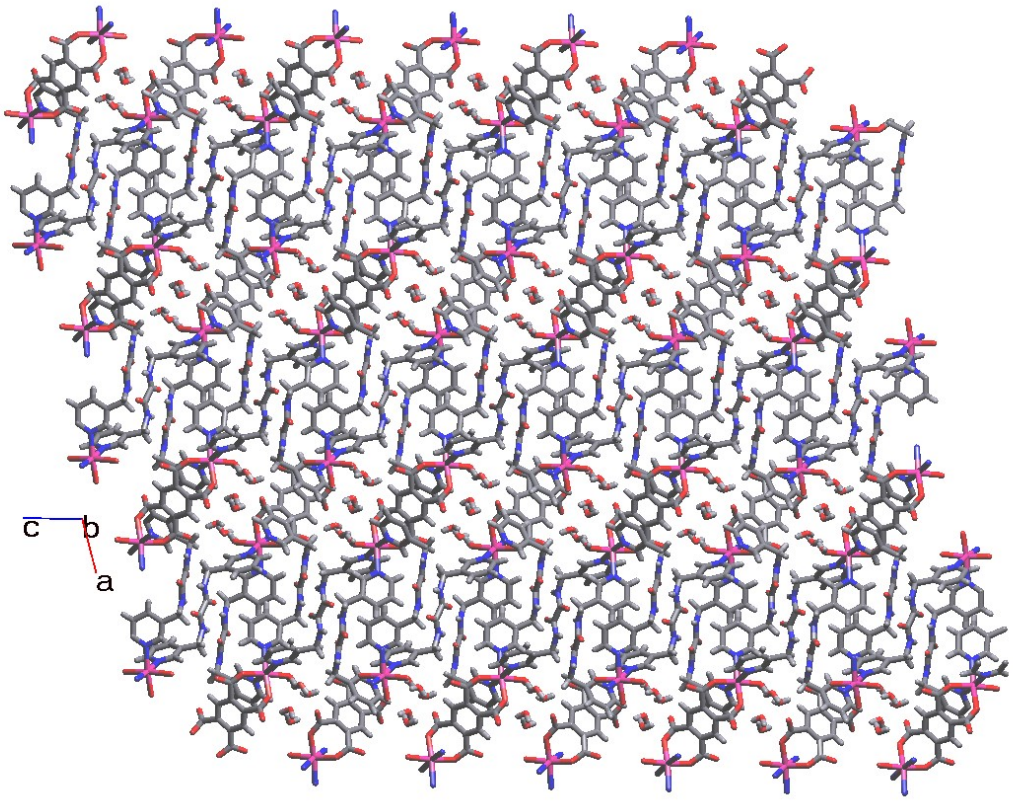

**Fig. S4.** A drawing showing the 2D layer of **4**.

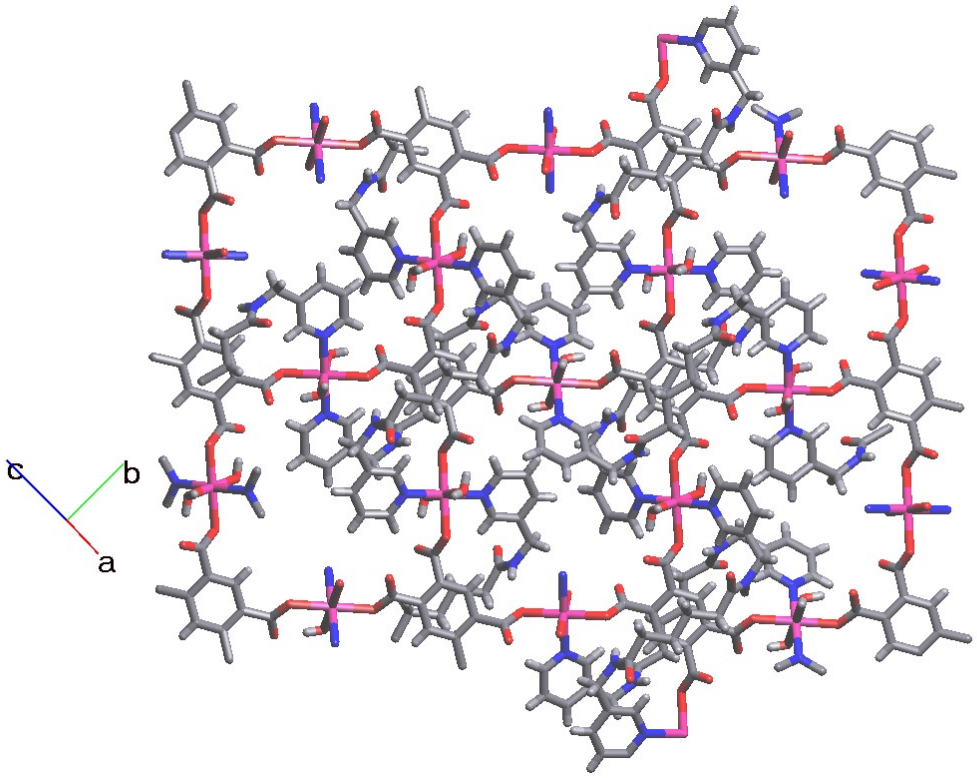

**Fig. S5.** A drawing showing the 3D framework of **5**.

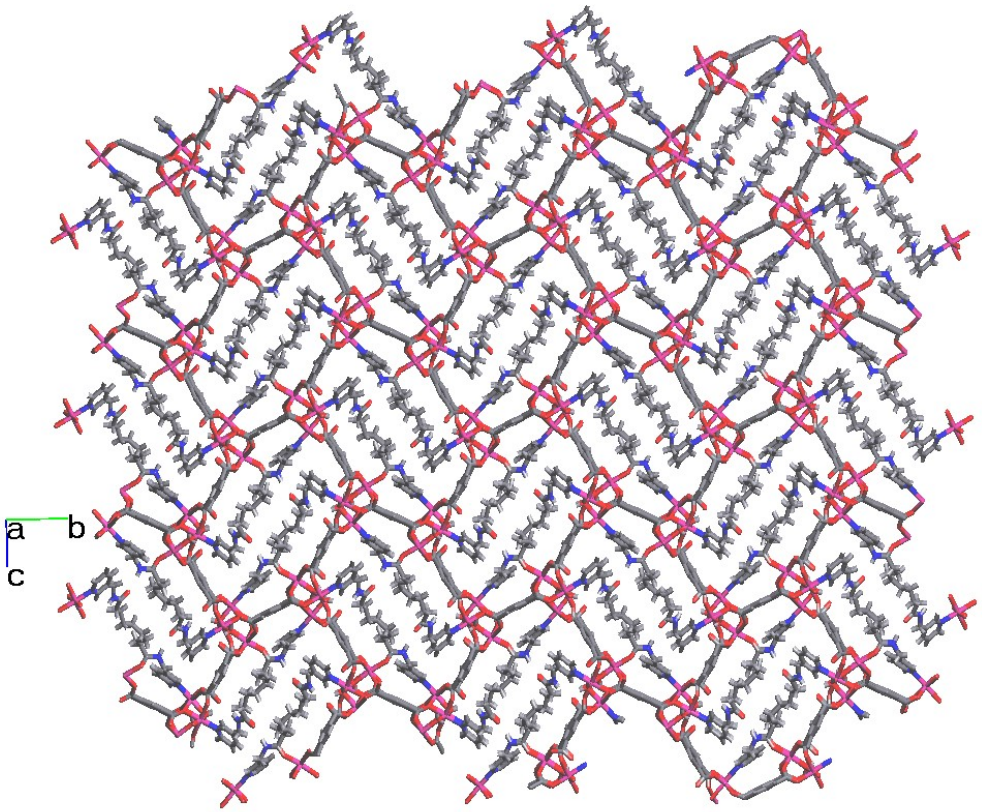

**Fig. S6.** Simulated and experimental PXRD patterns of **1**.

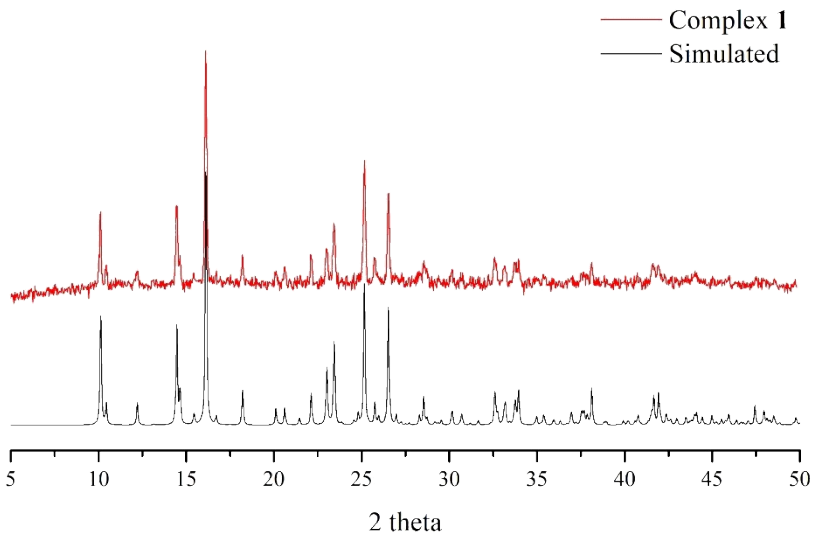

**Fig. S7.** Simulated and experimental PXRD patterns of **2**.

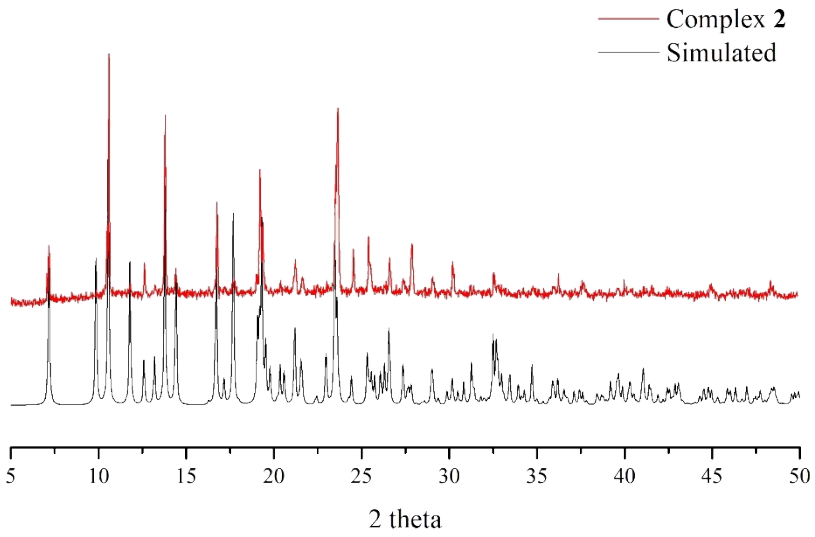

**Fig. S8.** Simulated and experimental PXRD patterns of **3**.

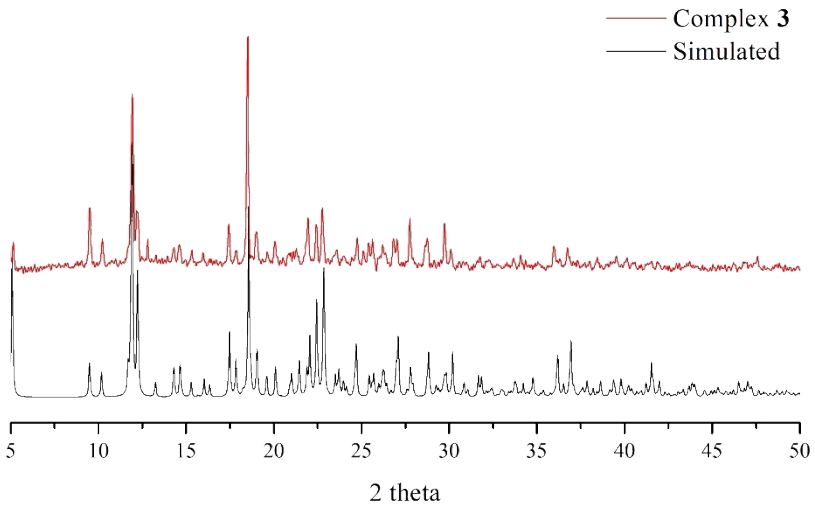

**Fig. S9.** Simulated and experimental PXRD patterns of **4**.

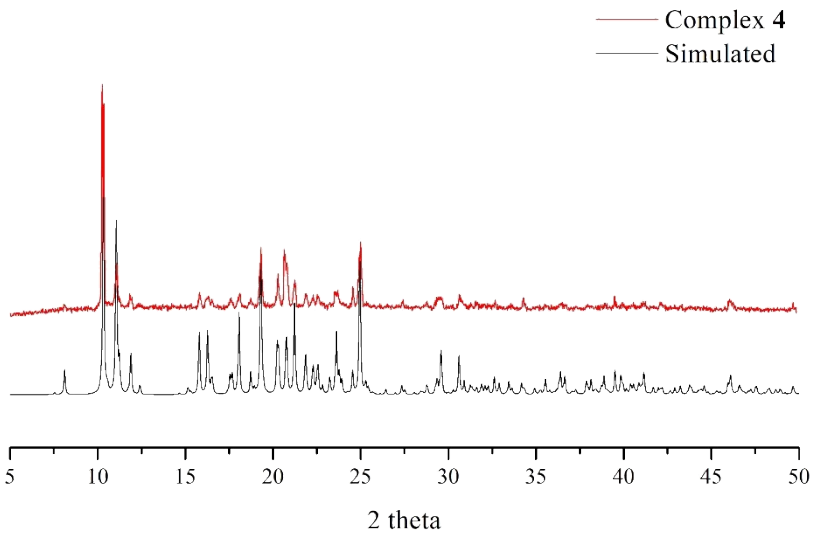

**Fig. S10.** Simulated and experimental PXRD patterns of **5**.

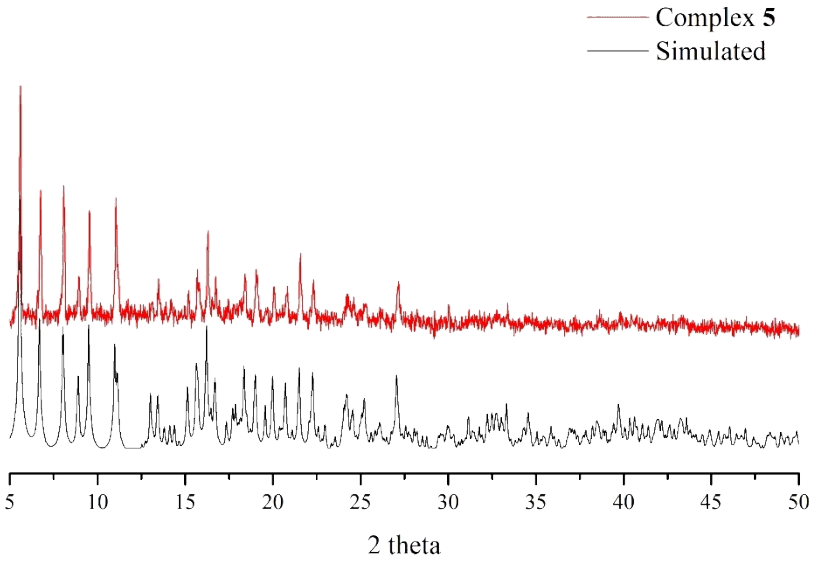

**Fig. S11.** The TGA curve for complex **1**.

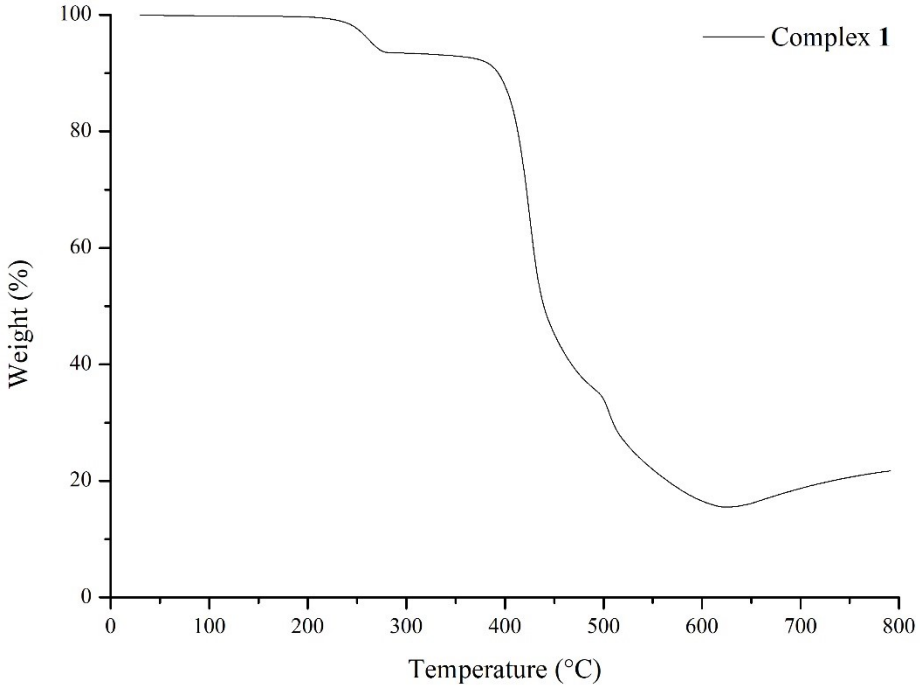

**Fig. S12.** The TGA curve for complex **2**.

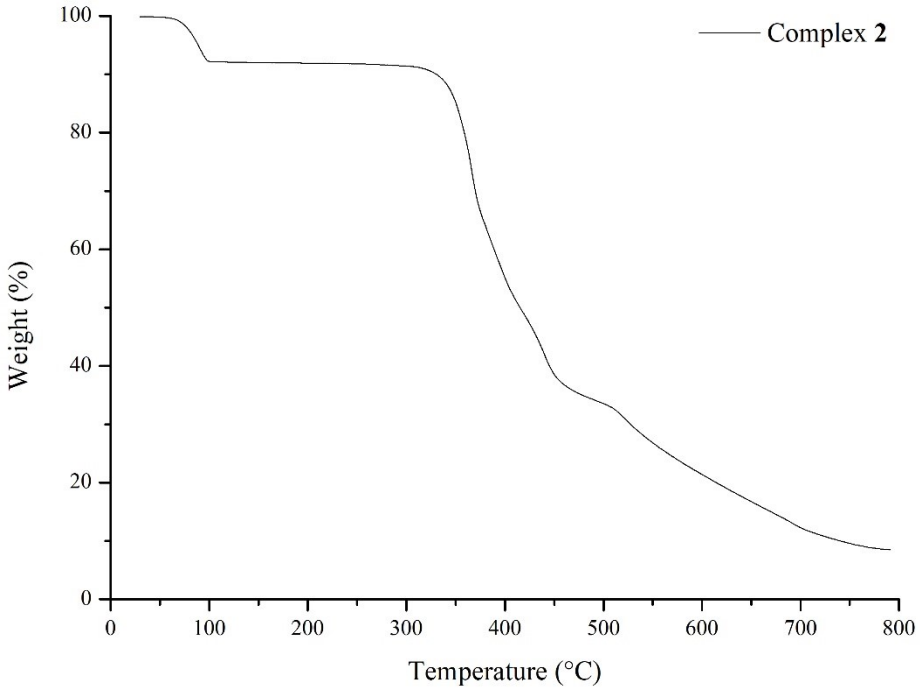

**Fig. S13.** The TGA curve for complex **3**.

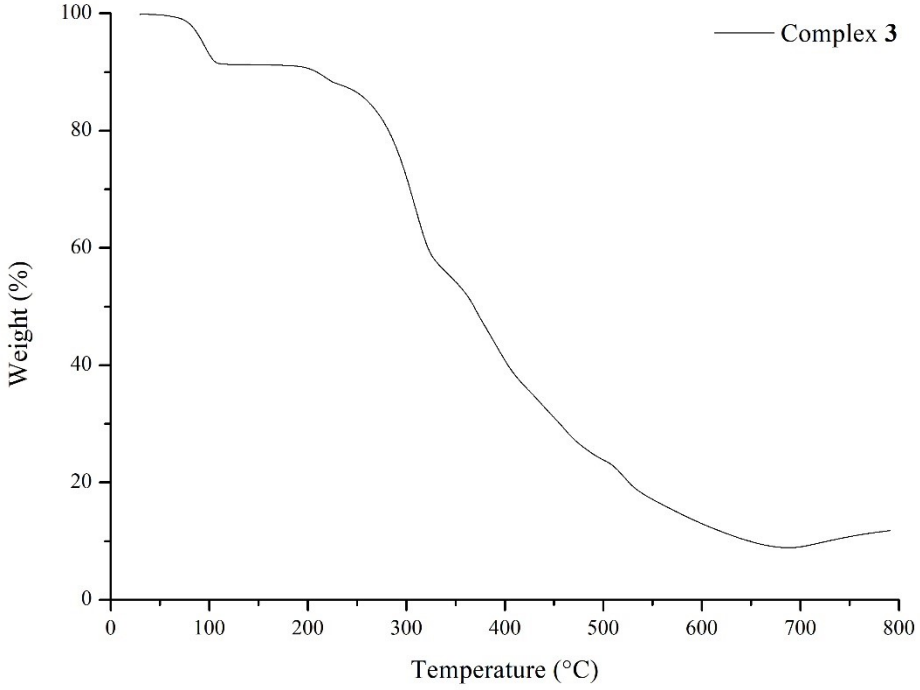

**Fig. S14.** The TGA curve for complex **4**.

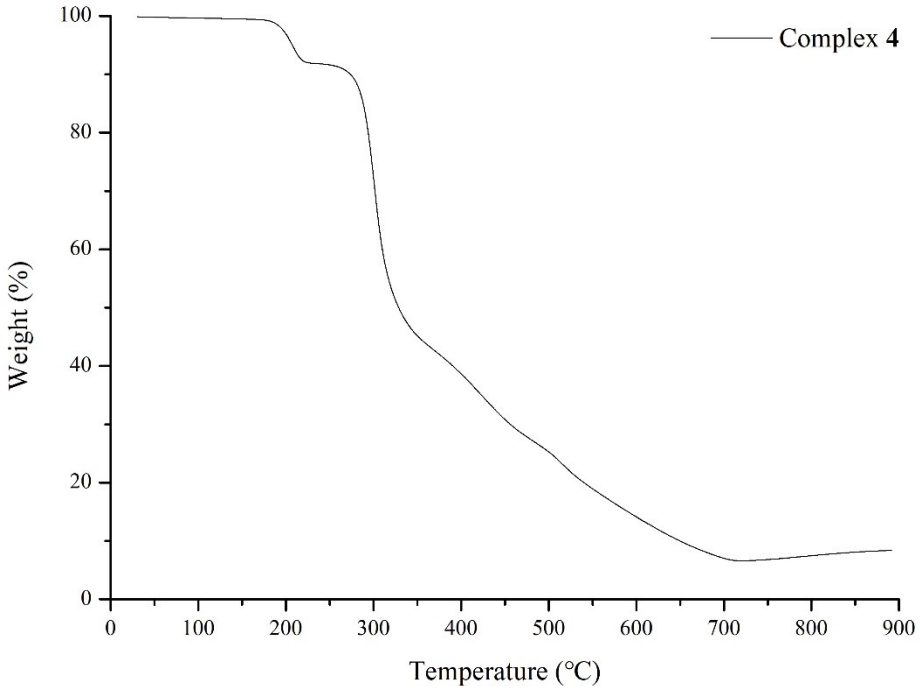

**Fig. S15.** The TGA curve for complex **5**.

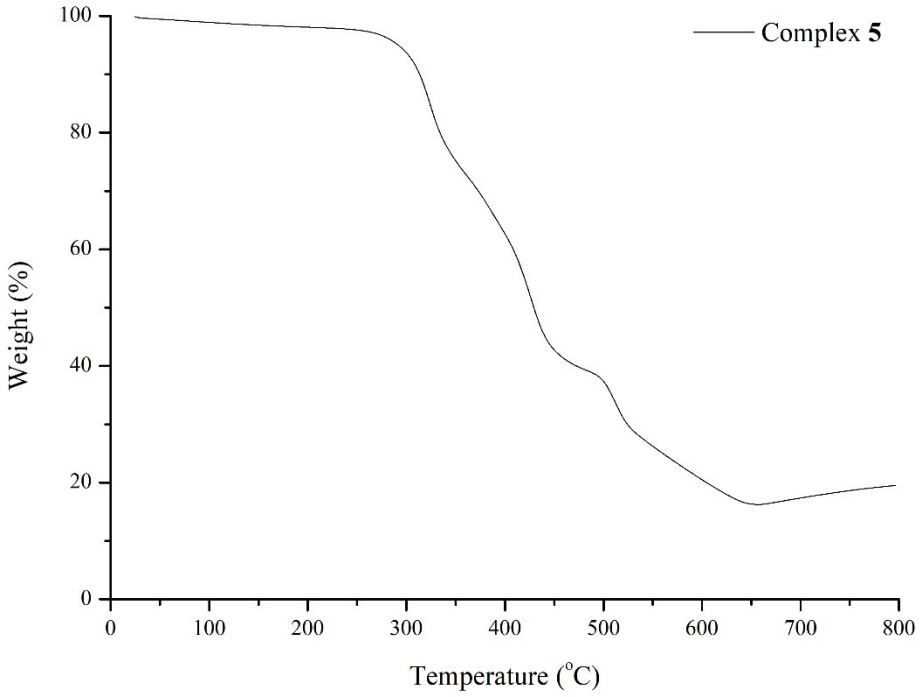

**Fig. S16.** PXRD patterns of complex **1** immersed in a variety of organic solvents.

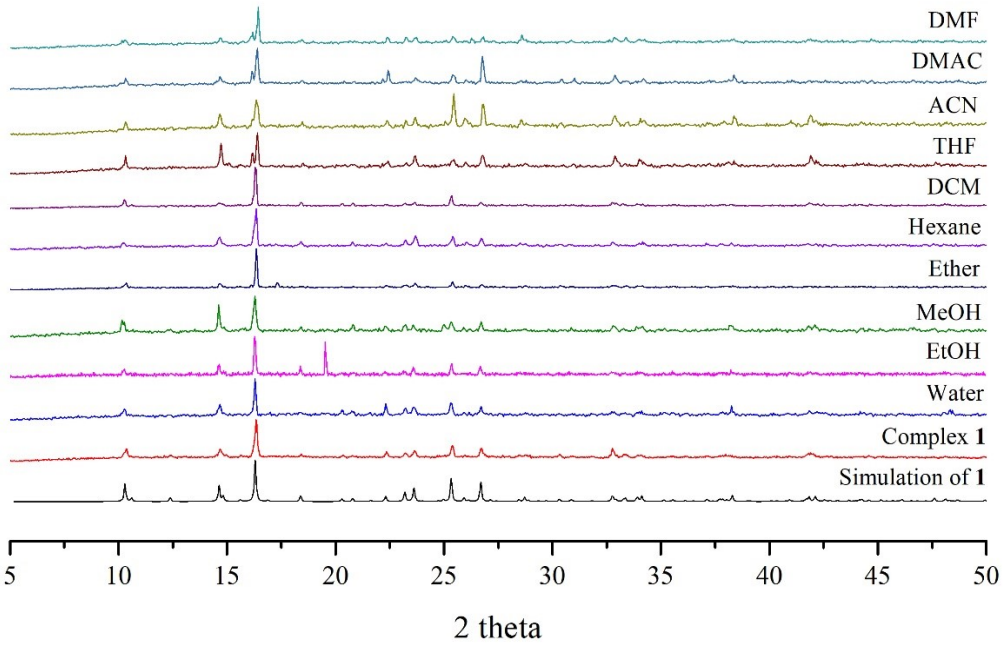

**Fig. S17.** PXRD patterns of complex **2** immersed in a variety of organic solvents.

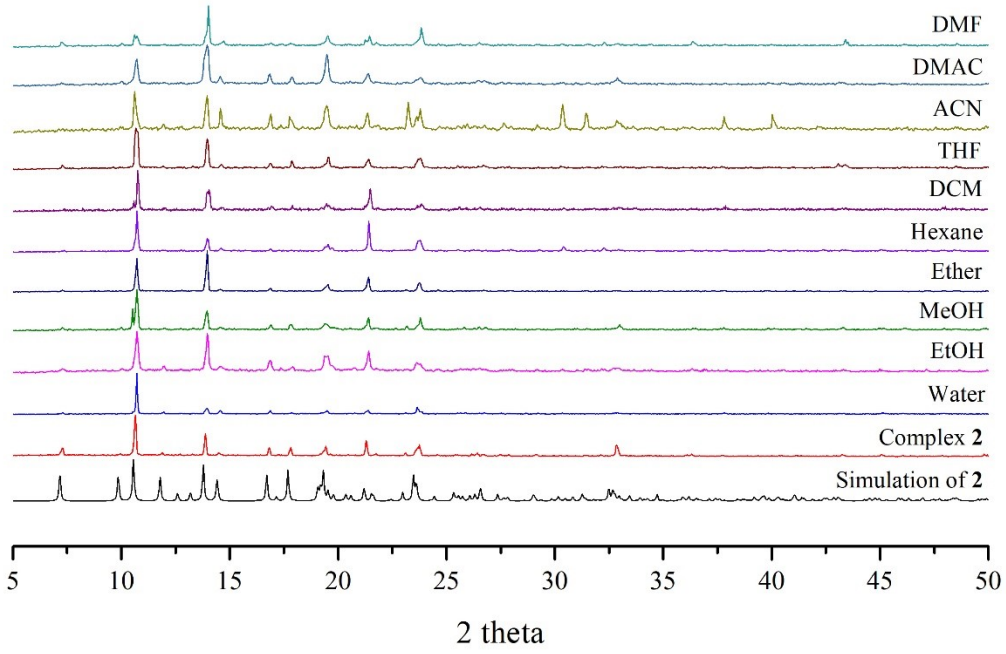

**Fig. S18.** PXRD patterns of complex **3** immersed in a variety of organic solvents.

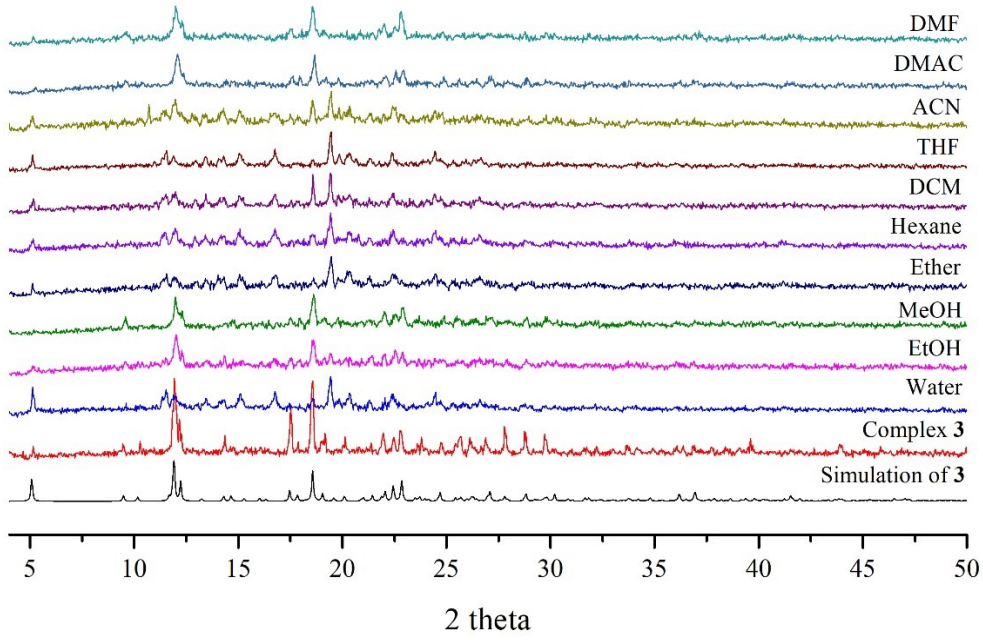

**Fig. S19.** PXRD patterns of complex **1** heated in water at 120, 100 and 80 °C in water for 2nd hydrothermal reaction.

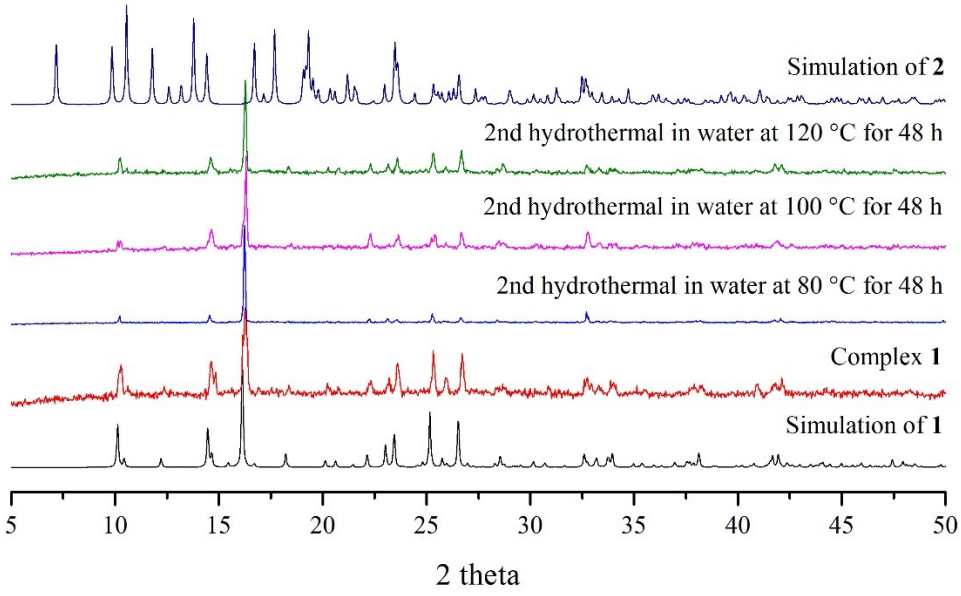

**Fig. S20.** PXRD patterns of complex **1** heated at 120, 100 and 80 ℃ in EtOH for 2nd hydrothermal reaction.

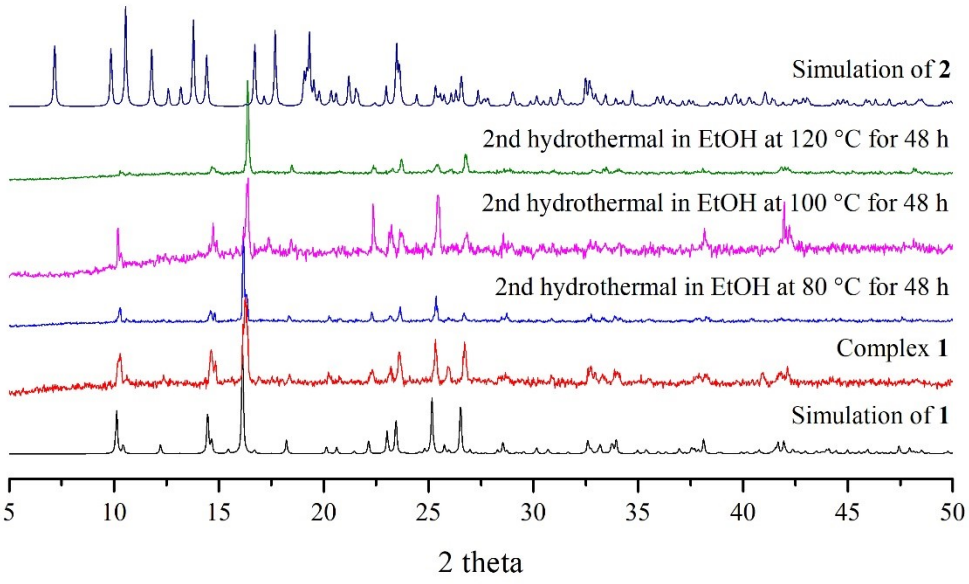

**Fig. S21.** PXRD patterns of complex **1** heated at 120, 100 and 80 ℃ in MeOH for 2nd hydrothermal reaction.

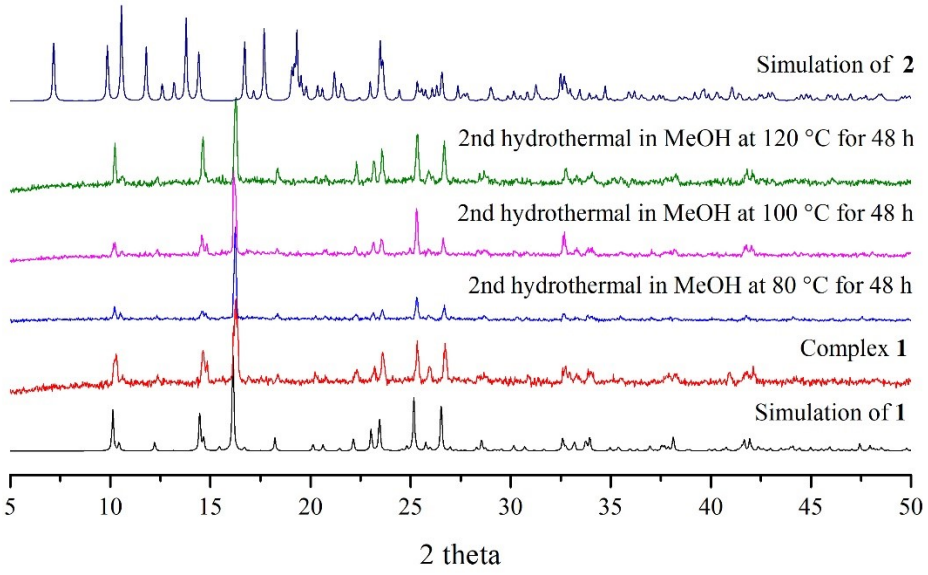

**Fig. S22.** PXRD patterns of complex **2** heated in water at 120, 100 and 80 °C in water for 2nd hydrothermal reaction.

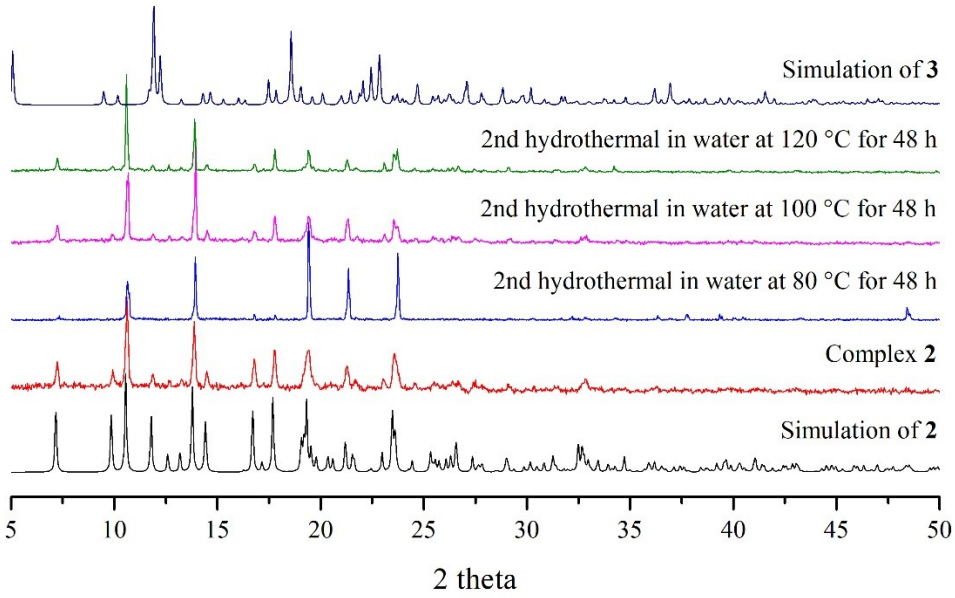

**Fig. S23.** PXRD patterns of complex **2** heated at 120, 100 and 80 °C in EtOH for 2nd hydrothermal reaction.

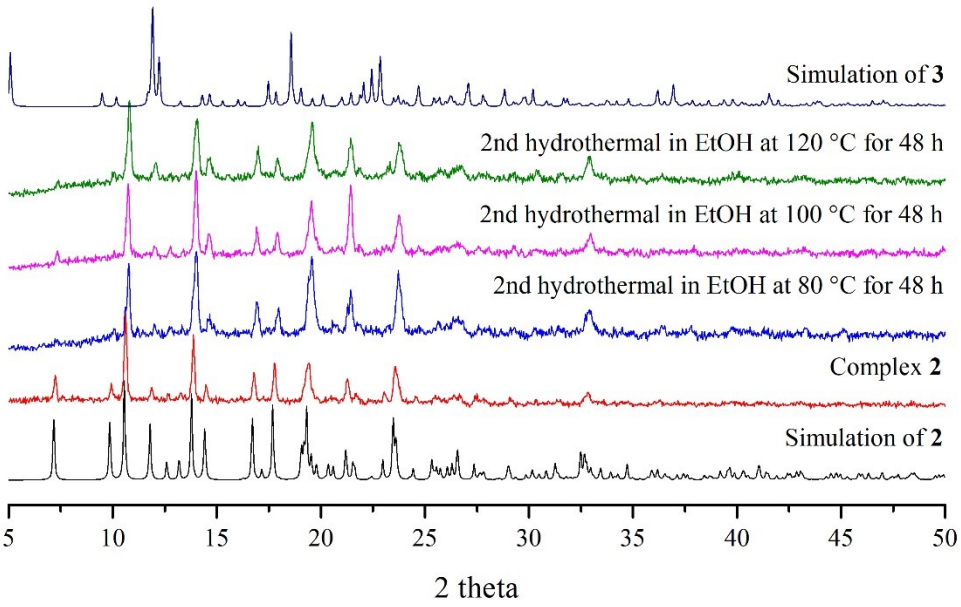

**Fig. S24.** PXRD patterns of complex **2** heated at 120, 100 and 80 °C in MeOH for 2nd hydrothermal reaction.

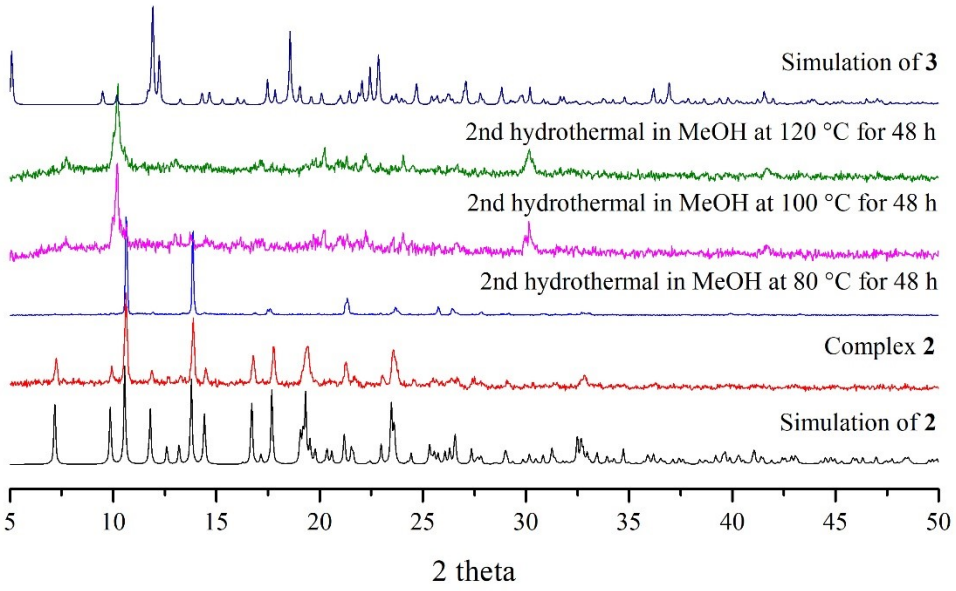

**Fig. S25.** PXRD patterns of complex **2** heated at 120 ℃ for 2 h and then immersed in a variety of organic solvents.

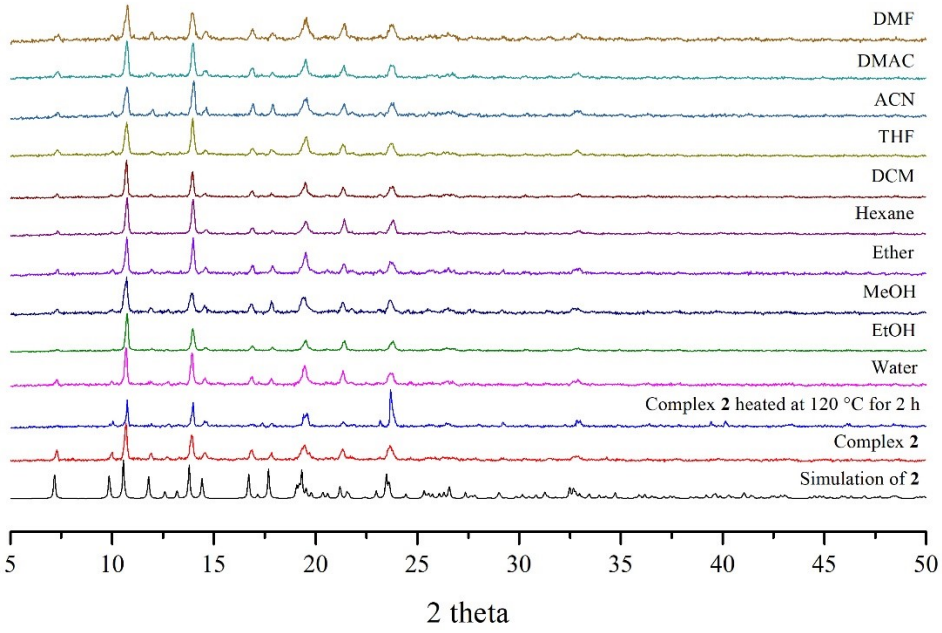

**Fig. S26.** PXRD patterns of complex **3** heated at 120 ℃ for 2 h and then immersed in a variety of organic solvents.

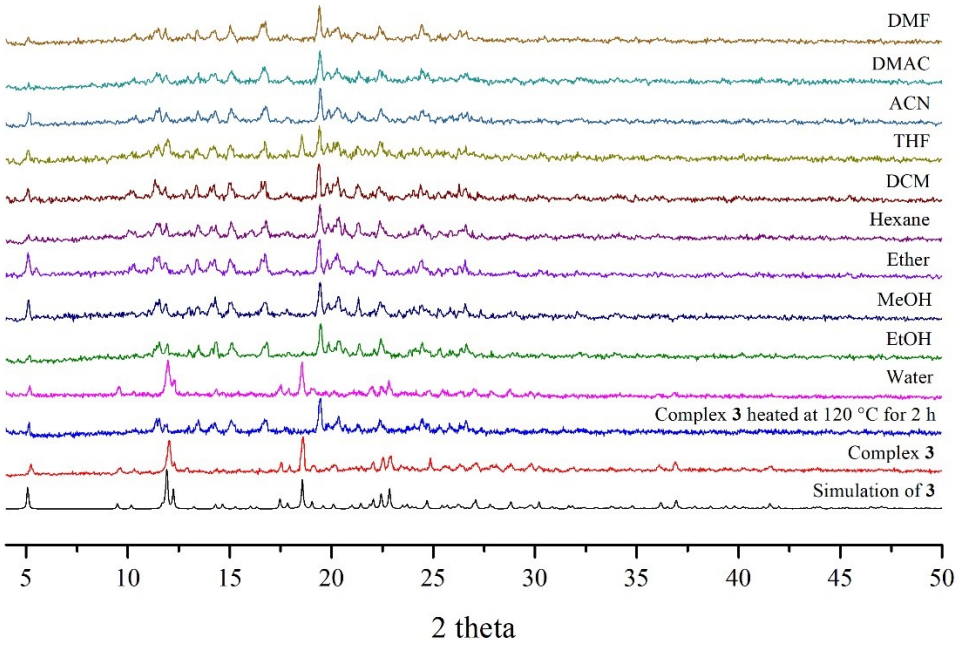

**Fig. S27.** A drawing showing lattice structure for complex **1**.

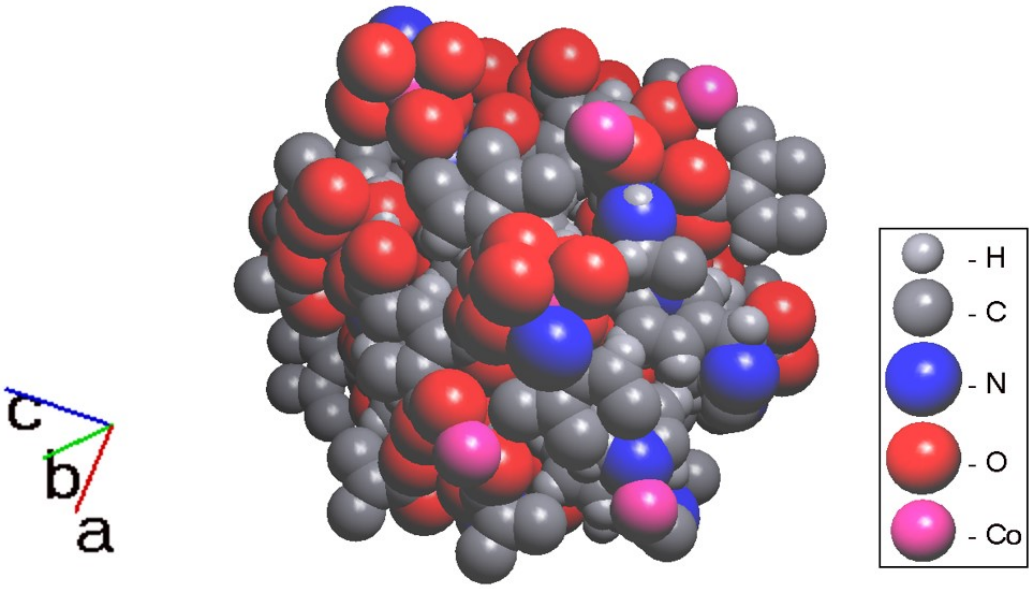

**Fig. S28.** A drawing showing lattice structure for complex **2** without the guest solvent molecules.

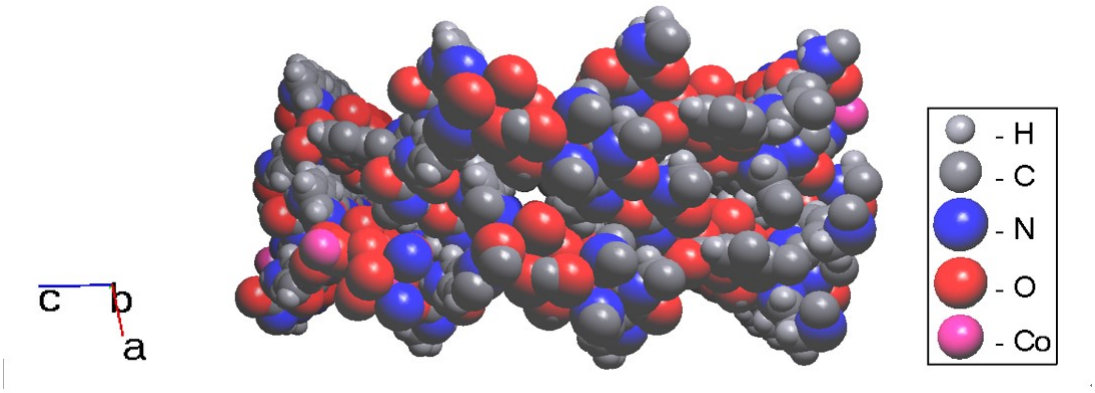

**Fig. S29.** A drawing showing lattice structure for complex **3** without the guest solvent molecules.

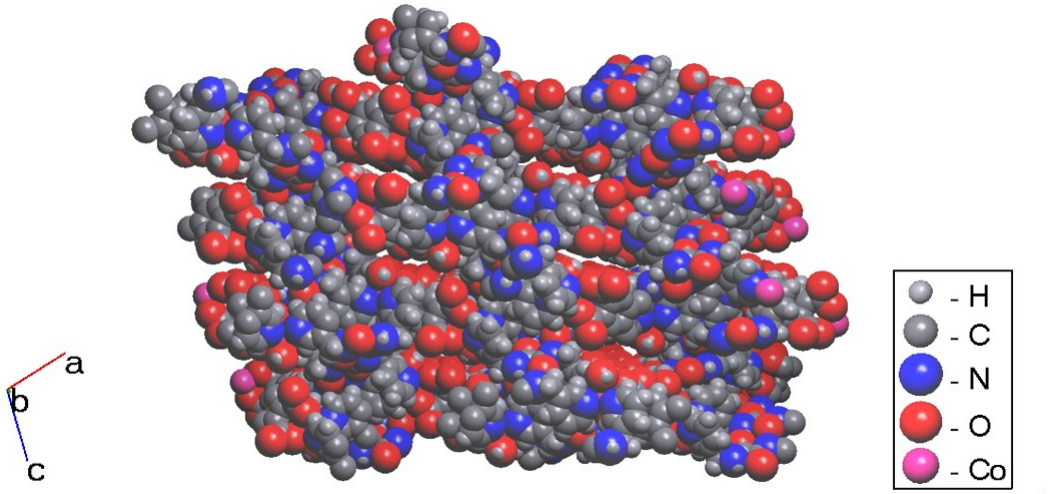

**Fig. S30.** PXRD patterns of complex **1** heated at 120 ℃ for 24 h under vacuum.

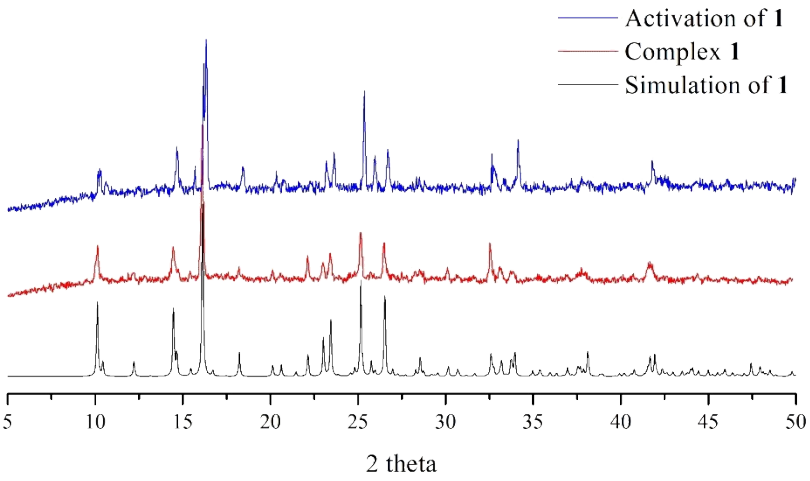

**Fig. S31.** PXRD patterns of complex **2** heated at 120 ℃ for 24 h under vacuum.

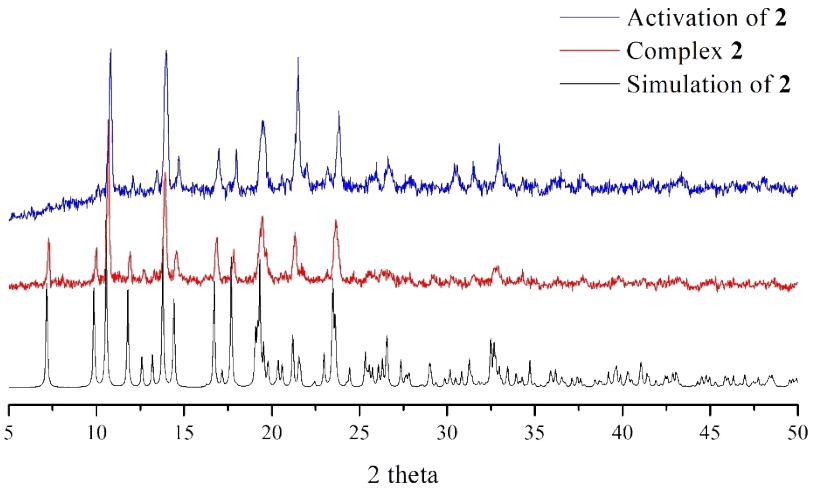

**Fig. S32.** PXRD patterns of complex **3** heated at 120 ℃ for 24 h under vacuum.

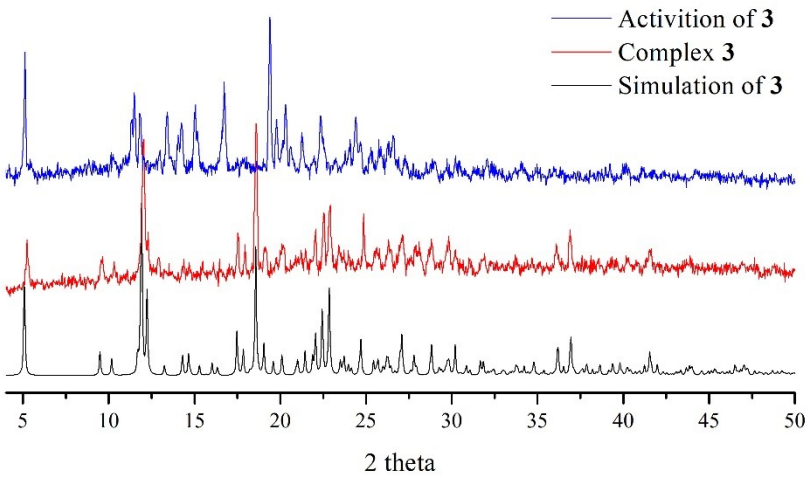

**Fig. S33.** $N_2$ adsorption−desorption isotherms for complex **1** at 77 K.

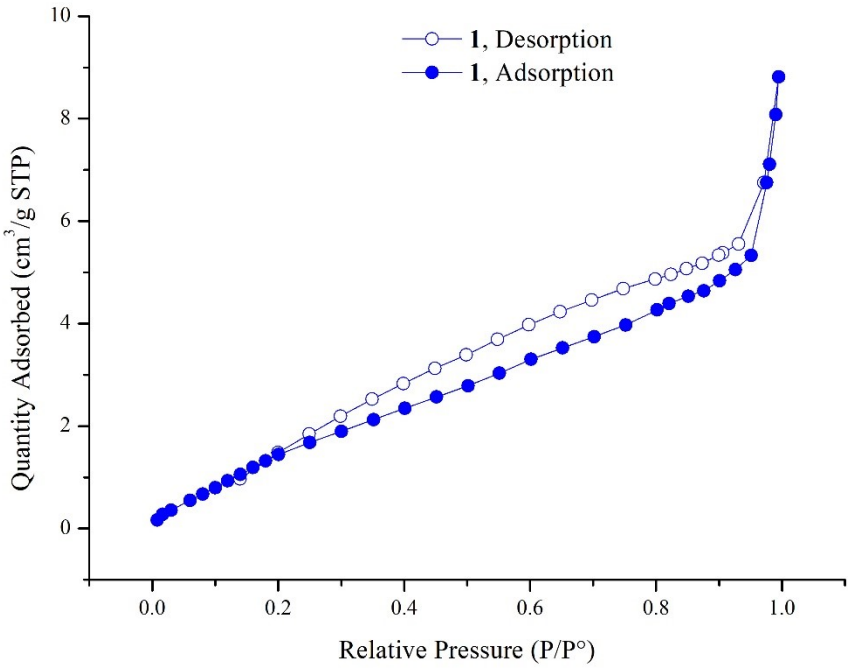

**Fig. S34.** $N_2$ adsorption−desorption isotherms for complex **2** at 77 K.

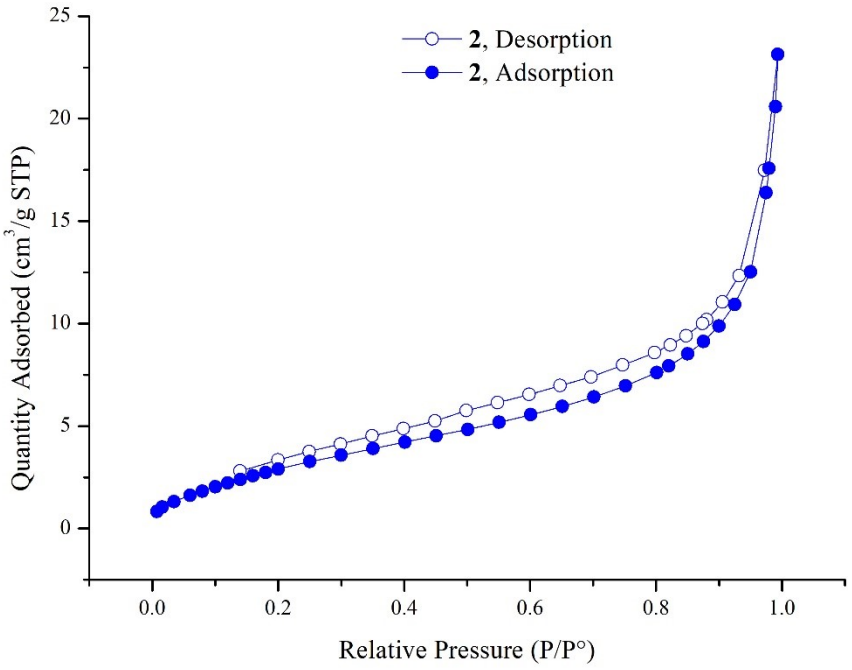

**Fig. S35.** $N_2$ adsorption−desorption isotherms for complex **3** at 77 K.

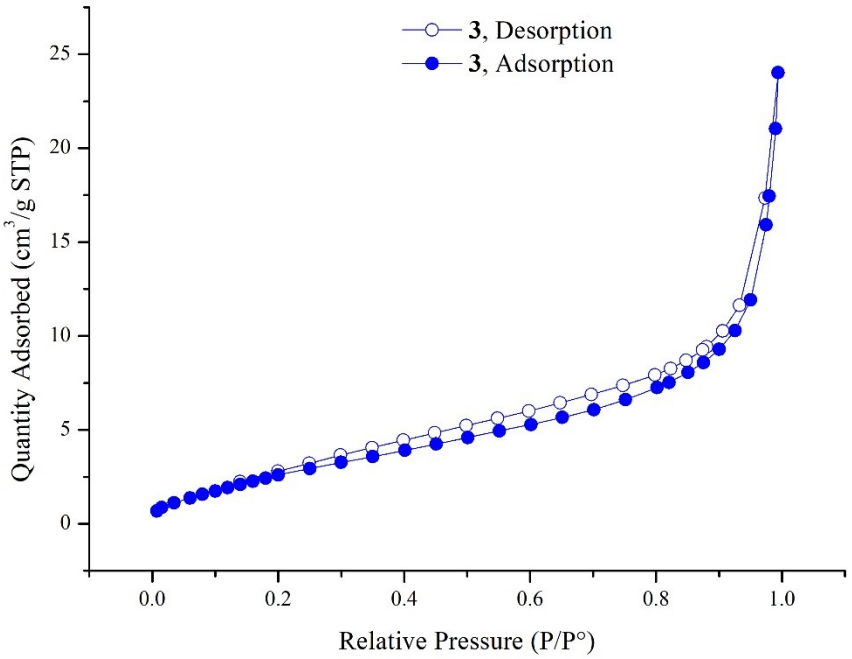

**Fig. S36.** Pore-size distribution curve for complex **1**.

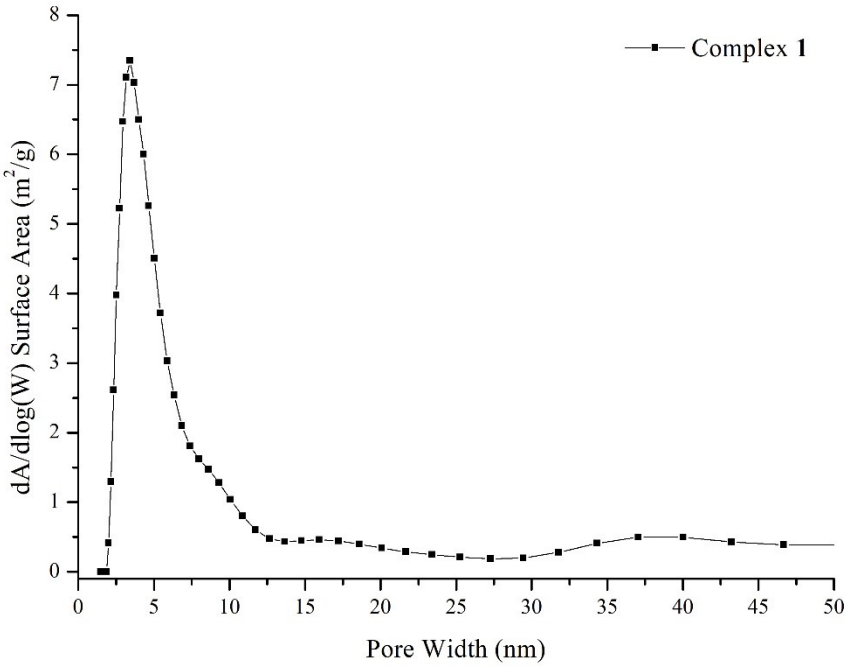

**Fig. S37.** Pore-size distribution curve for complex **2**.

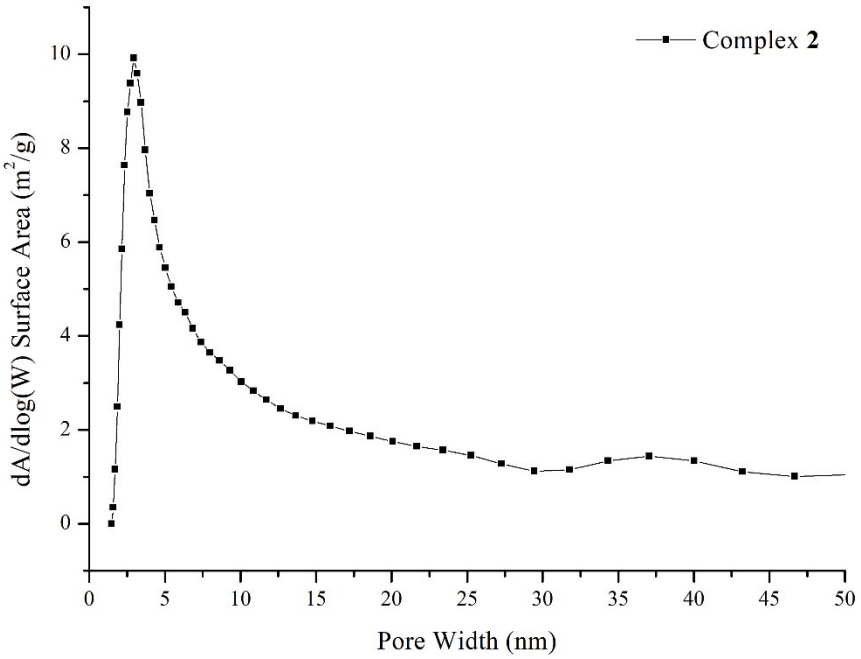

**Fig. S38.** Pore-size distribution curve for complex **3**.

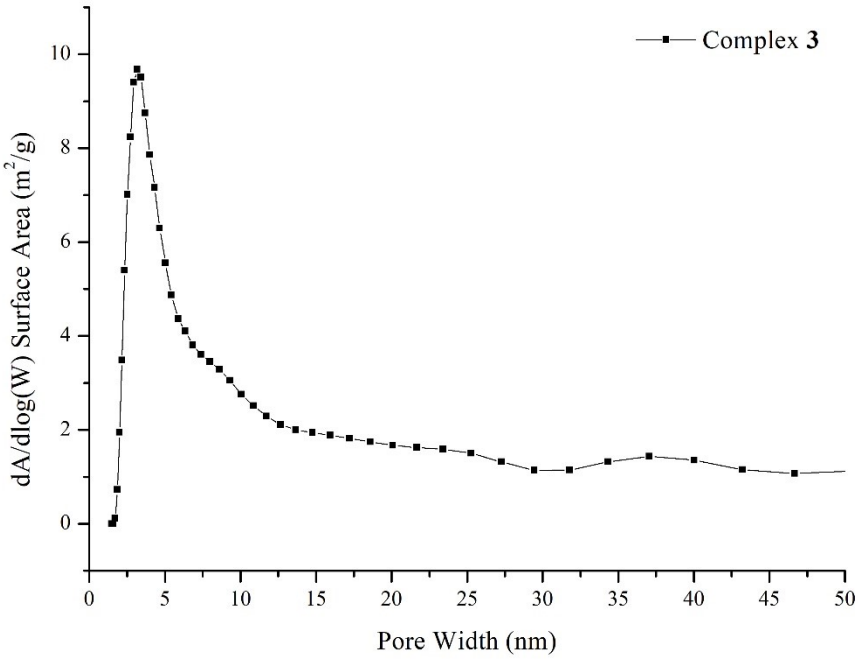

**Fig. S39.** $CO_2$ adsorption−desorption isotherms for complex **1**, **2** and **3** at 273 K.