High proton conductivityin a charge carrier induced Ni(II)-metal-organic framework

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Supporting Information

Experimental Section

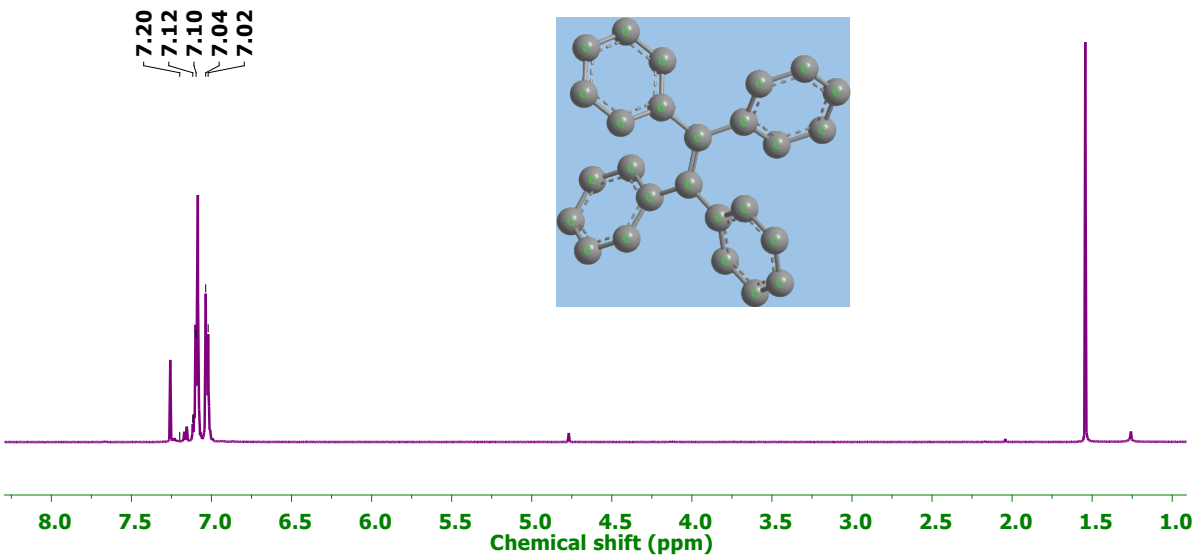

Fig.S1.^{1}H NMR spectra of TPE.

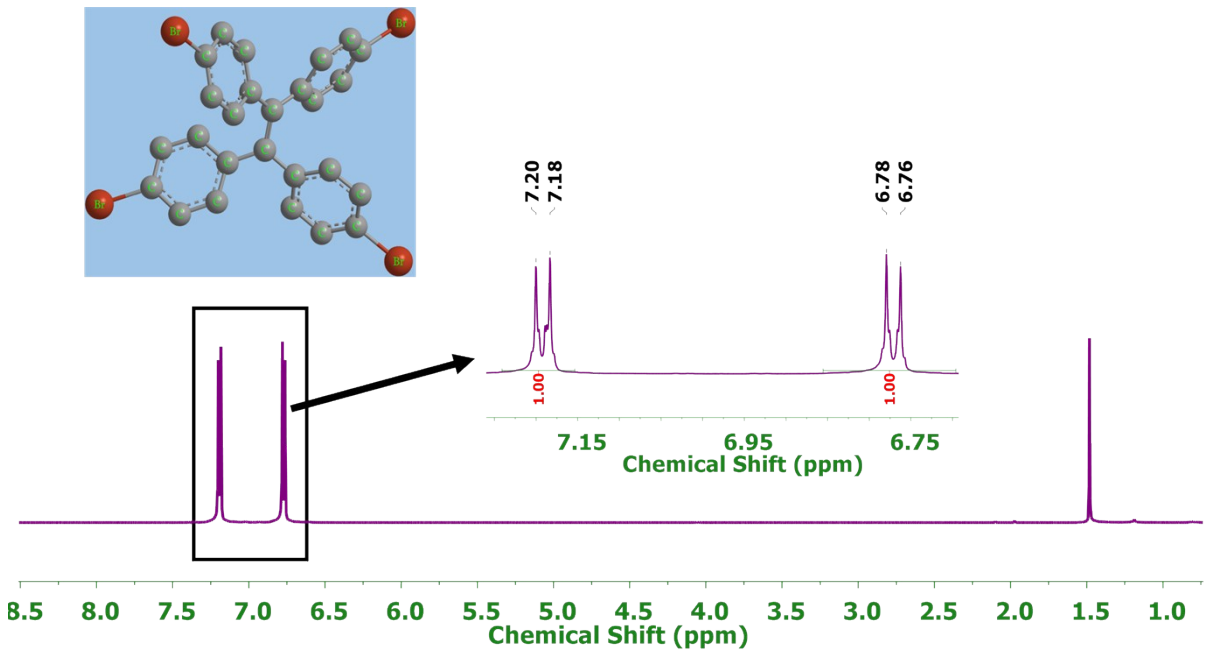

Fig. S2.^{1}H NMR spectra of TPE-Br.

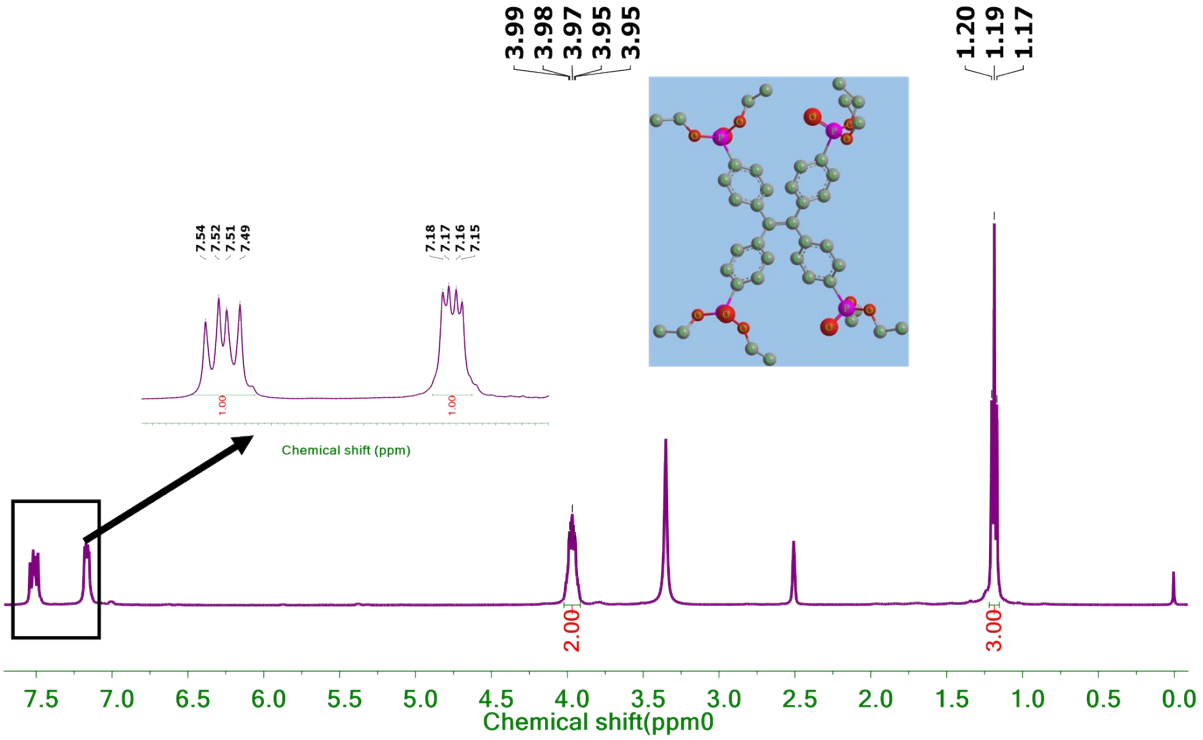

Fig. S3.[1]H NMR spectra of TPE-PE.

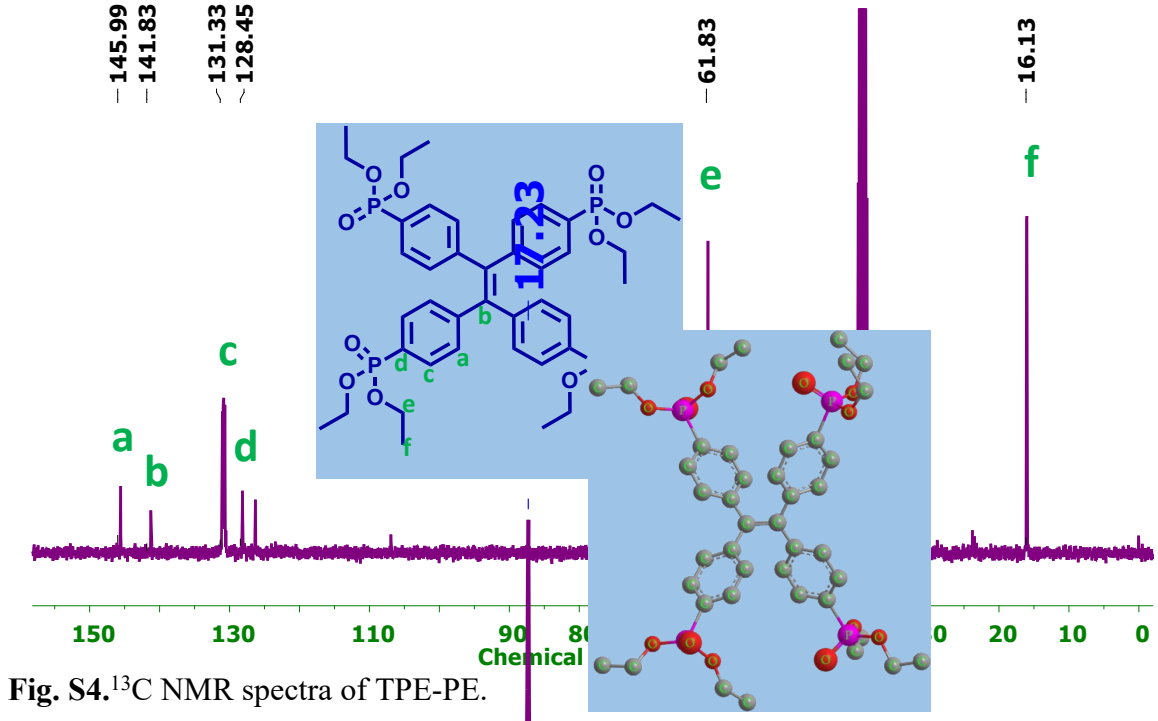

Fig. S4.[13]C NMR spectra of TPE-PE.

Fig. S5.[31]P NMR spectra of TPE-PE.

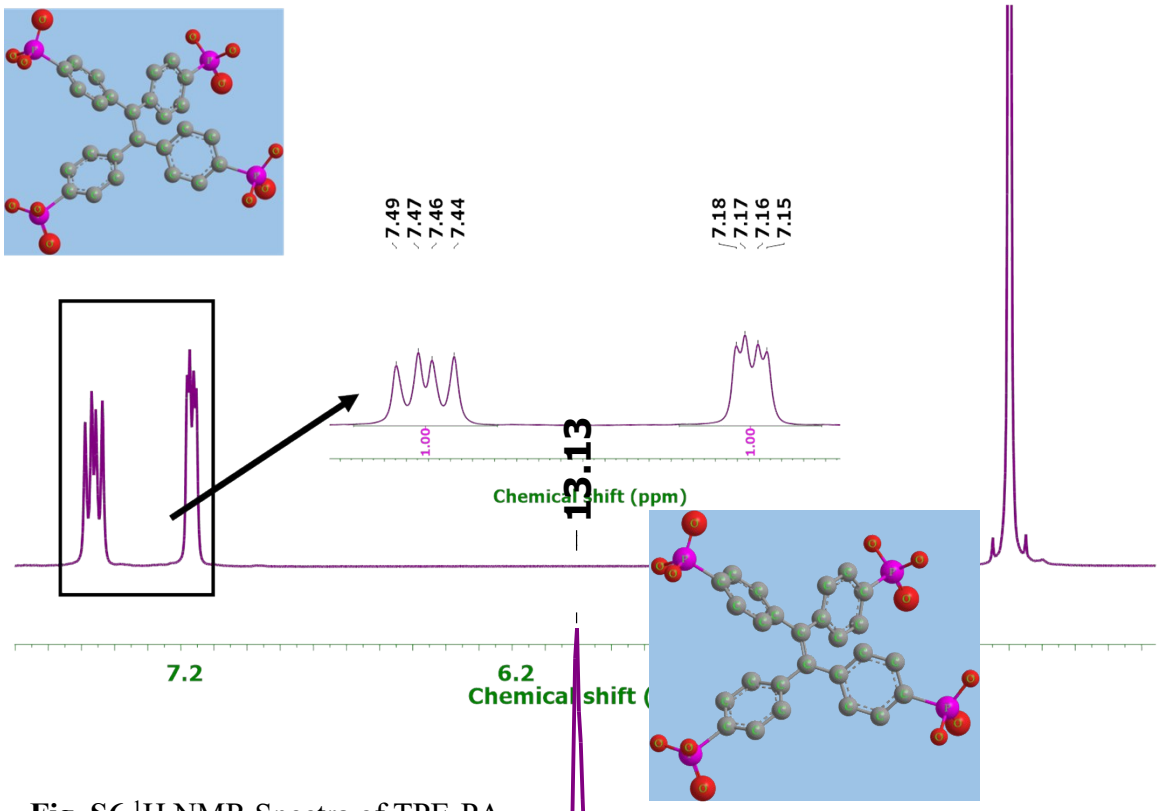

Fig. S6.[1]H NMR Spectra of TPE-PA.

Fig. S7. ^{31}P NMR spectra of TPE-PA.

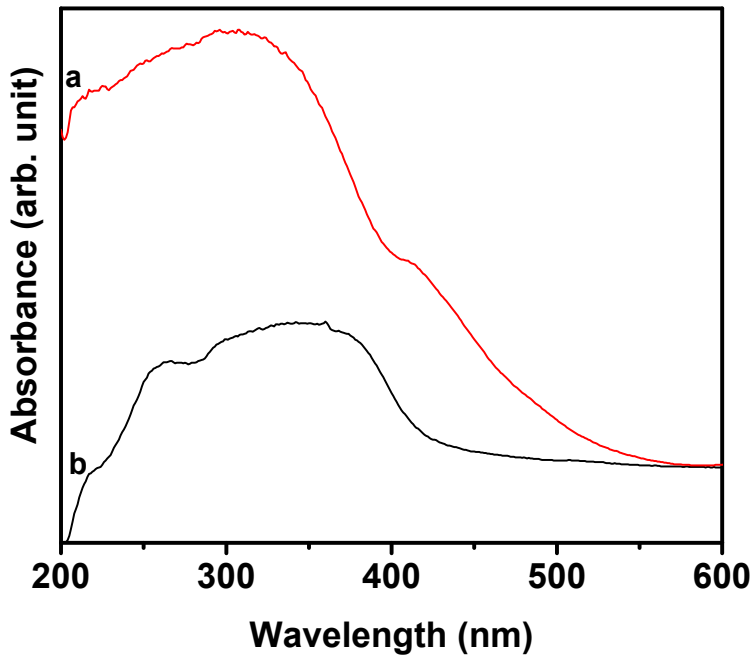

Fig. S8. Solid state UV-Visible spectra of as-synthesized H_8L-Ni-MOF (a) and H_8L-ligand (b).

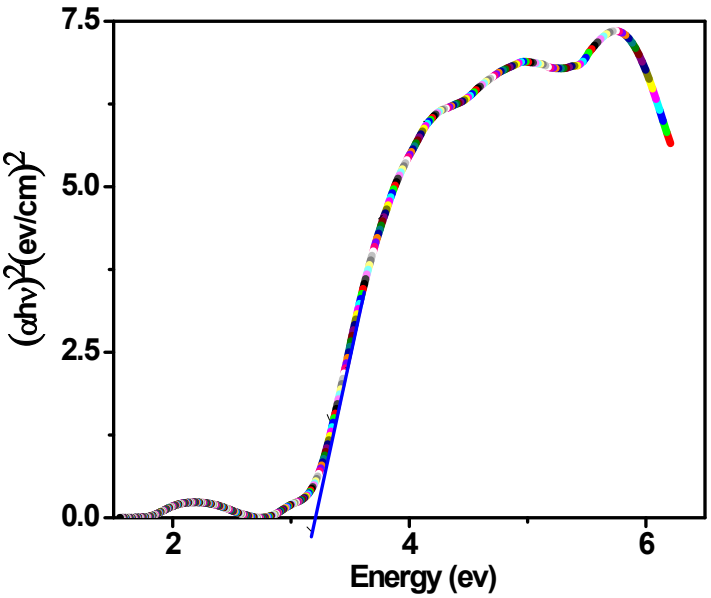

Fig. S9. Direct optical band gap of H_8L-Ni-MOF material using Tauc equation.

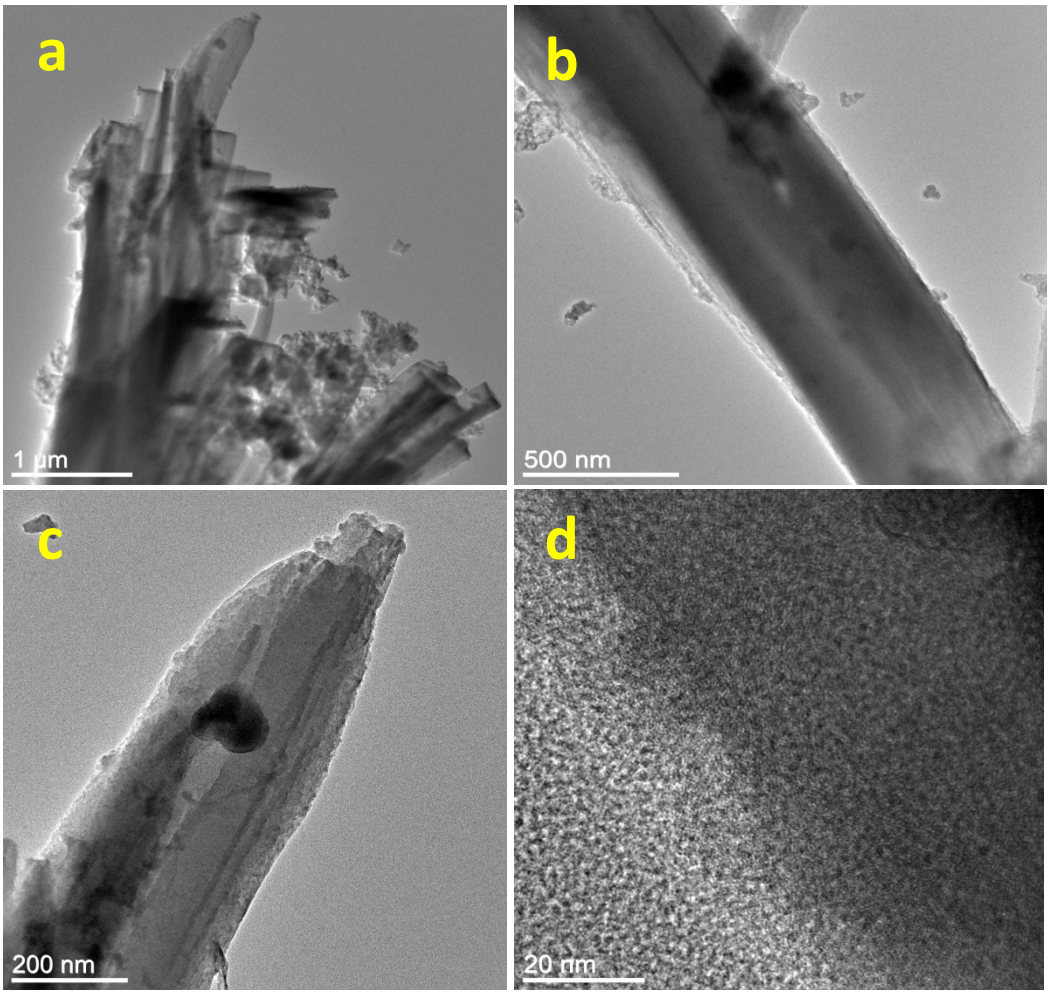

Fig. S10.UHR-TEM images with different magnification of H_8L-Ni-MOF.

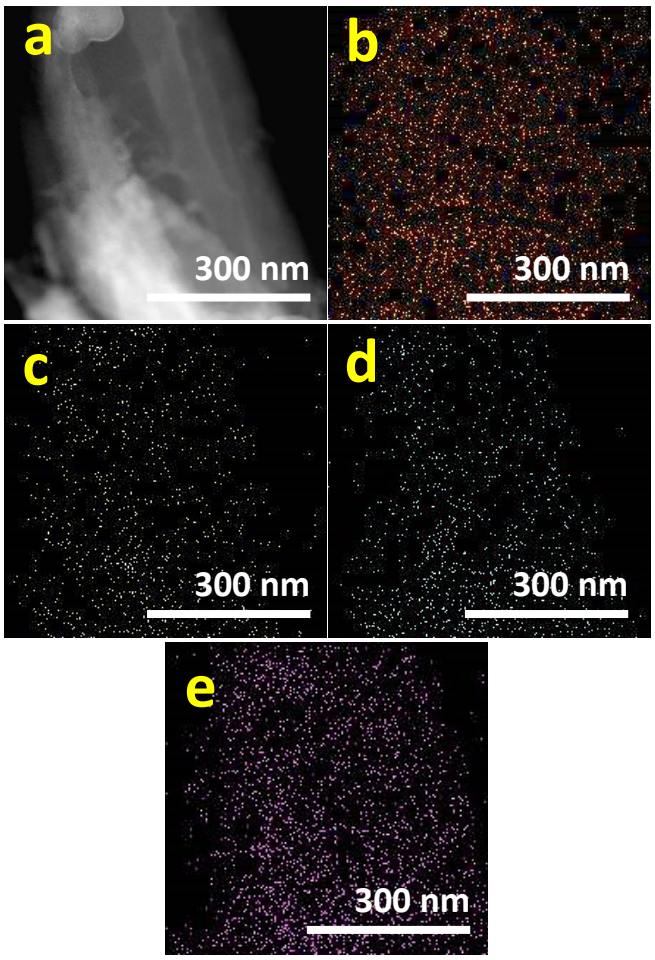

Fig. S11.HADDF image and elemental mapping of H_8L-Ni-MOF material containing elements (b) C, (c) P, (d) O, and (e) Ni.

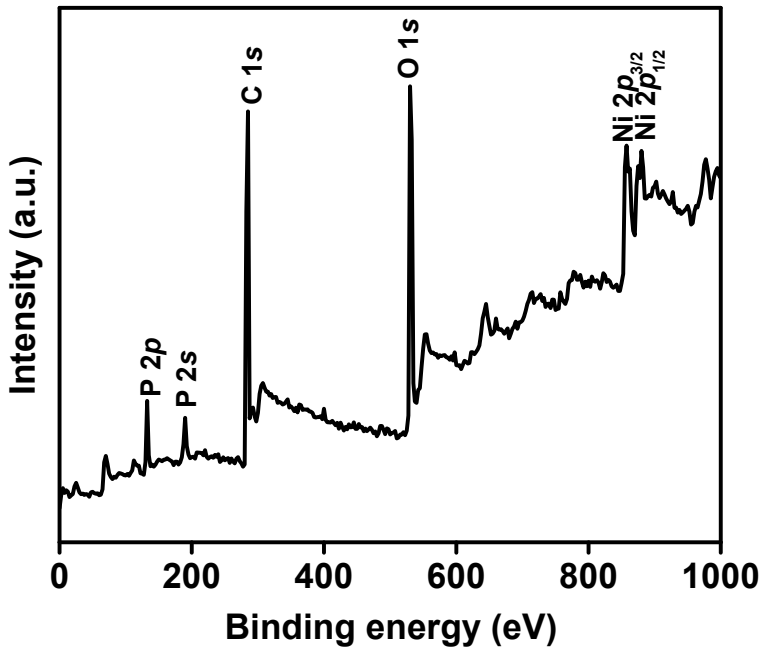

Fig. S12. Full scale XPS survey spectrum of H_8L-Ni-MOF.

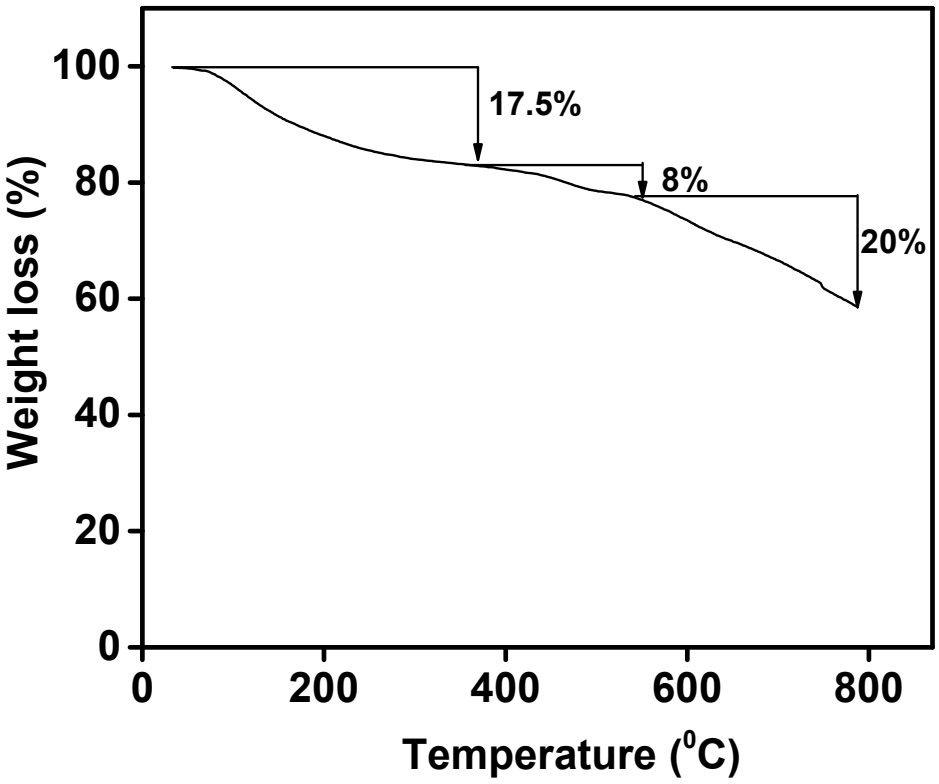

Fig. S13.TGA plot of H_8L-Ni-MOF material in N_2 atmosphere.

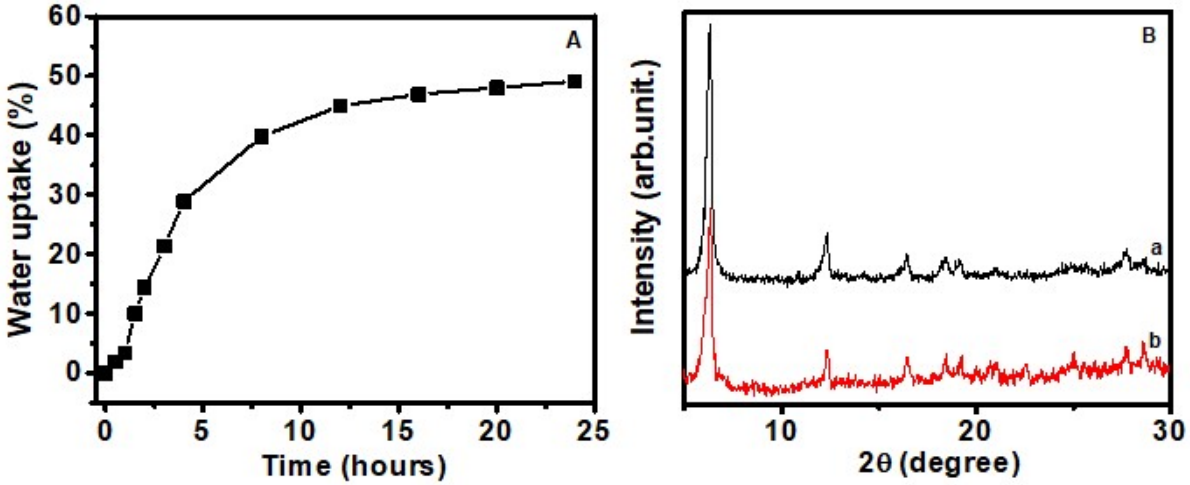

Fig. S14. Water uptake (weight %) of H_8L-Ni-MOF with time at 30 °C under 98% RH (A) and PXRD pattern of the H_8L-Ni-MOF (B) as-synthesized (a), after water uptake (b).

Table S1. Proton conductivity of H^+@H_8L-Ni-MOF at 98% RH in different temperatures.

Temperature (°C)	Proton Conductivity (S cm^{-1})	
	Without doping	SA-doped sample
20	9.36×10^{-6}	3.45×10^{-3}
30	1.25×10^{-5}	4.07×10^{-3}
40	1.56×10^{-5}	4.73×10^{-3}
50	1.97×10^{-5}	5.20×10^{-3}
60	2.60×10^{-5}	6.31×10^{-3}
70	3.11×10^{-5}	7.67×10^{-3}
80	4.67×10^{-5}	9.77×10^{-3}
90	5.45×10^{-5}	1.17×10^{-2}

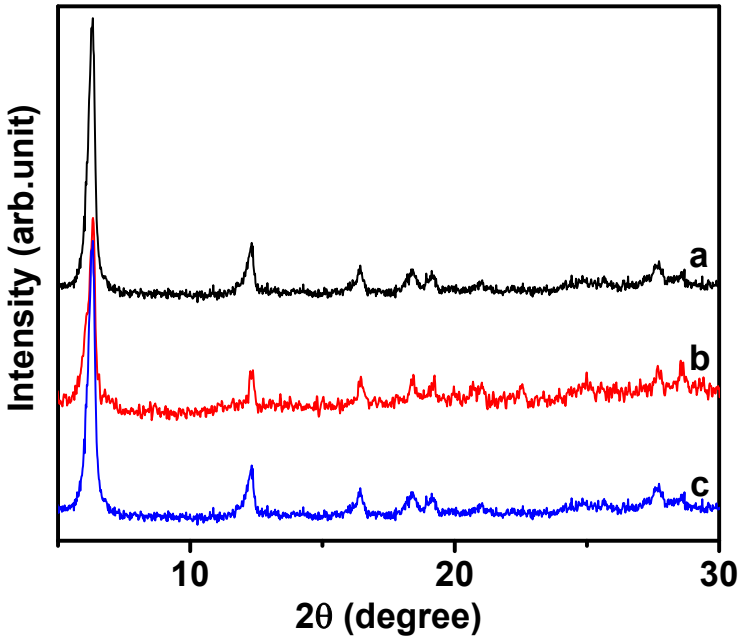

Fig. S15.PXRD pattern data of as-synthesized MOF (a), H^+@H_8L-Ni-MOF (b), and washed H^+@H_8L-Ni-MOF after proton conductivity measurement (c).