Supporting information

Layered manganese-based metal-organic framework as a high capacity electrode material for supercapacitors

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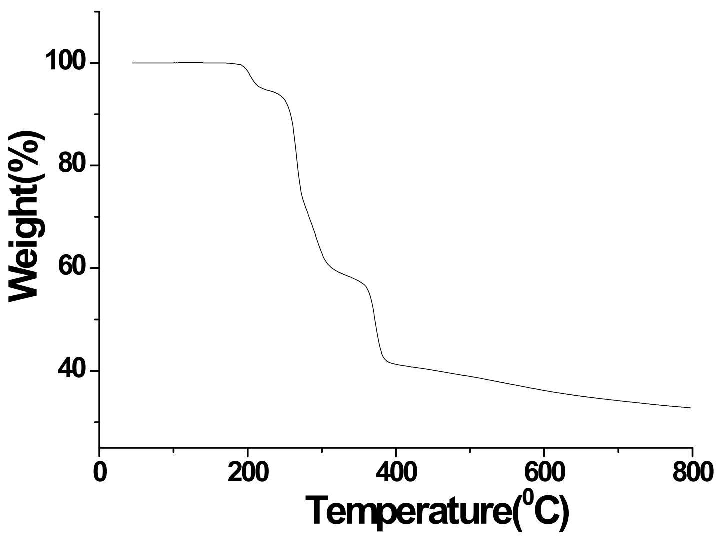

Figure S1 TGA curve of as-synthesized Mn−LMOF

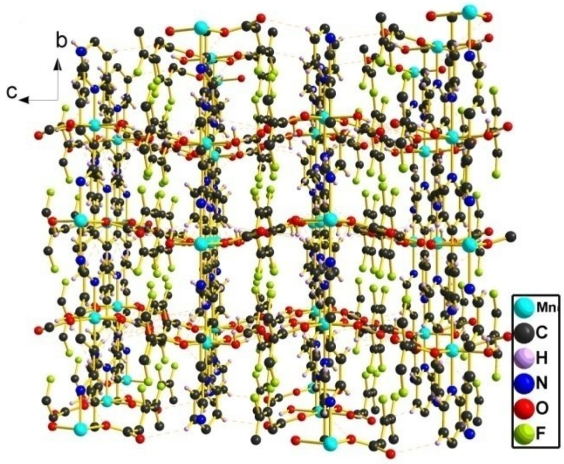

Figure S2 3D view of Mn−LMOF

Table S1. Specific capacitance of Mn−LMOF electrode in this study, compared with some MOF-based and Mn-based materials electrodes reported in previous literature.

Electrode material	Specific capacitance	Electrode configuration	Remarks	Ref.
Co-MOF film	206 F g^{-1} at 0.6 Ag^{-1} in 1 M LiOH solution	Three	Potential window 0–0.5 V for charge–discharge	34
Co-BPDC MOF film	179 F g^{-1} at 10 mVs^{-1} in 0.5 M LiOH solution	Three	Specific capacitance was measured in cyclic voltammetry	35
meso-and microporous Co-MOF	230.5 F g^{-1} at 0.5 A g^{-1} in 1 M LiOH solution	Three	Potential window 0–0.6 V for charge–discharge	36
PANI-ZIF-67-CC	2146 mF cm^{-2} at 10 mV s^{-1} in 3 M KCl solution	Three	Areal capacitance was measured in cyclic voltammetry	37
2D Layered Co-LMOF	2474 F g^{-1} at 1 A g^{-1} in 1 M KOH solution	Three	High rate capability, good cyclic stability	38
Layered structural Co-MOF nanosheets	2654 F g^{-1} at 1 A g^{-1} in 5 M KOH solution	Three	High rate capability, good cyclic stability	39
Zr-LMOF	1144 F g^{-1} at 5 mVs^{-1} in 6 M KOH solution	Three	Specific capacitance was measured in cyclic voltammetry	41
ZIF-67 microflowers	202.6 F g^{-1} at 0.5 A g^{-1} in 1 M KOH solution	Three	Potential window 0–0.45 V for charge–discharge	42
Ni-MOF-24	1127 F g^{-1} at 0.5 A g^{-1} in 6 M KOH solution	Three	High rate capability, good cyclic stability	43

Zn-doped Ni-MOF	1620 F g^{-1} at 0.25 A g^{-1} in 6 M KOH solution	Three	High rate capability, good cyclic stability	44
$Ni_3(btc)_2 \cdot 12H_2O$	726 F g^{-1} at 1 A g^{-1} in 2 M KOH solution	Three	Potential window 0–0.5 V for charge–discharge	45
Ni-DMOF-ADC	552 F g^{-1} at 1 A g^{-1} in 2 M KOH solution	Three	Potential window 0–0.45 V for charge–discharge	46
$Ni_3(HITP)_2$	111 F g^{-1} at 1 A g^{-1} and 18 μF cm^{-2} in 1 M $TEABF_4$/ACN	Two	Potential window 0–1.0 V for charge–discharge	50
$Cd_2(TDC)_2(L)_2 \cdot 2H_2O$	22 F g^{-1} at 2.5 mA g^{-1} in 1 M Li_2SO_4 solution	Two	Potential window 0–1.3 V for charge–discharge	51
Cu-LCP	1274 and 1102 F g^{-1} at 1 A g^{-1} in 1 M LiOH and 1M KOH solution respectively	Three	High rate capability, good cyclic stability, and potential window 0–0.5 V for charge– discharge	53
CNTs@Mn-MOF	203.1 F g^{-1} at 1 A g^{-1} in 1 M Na_2SO_4	Three	Potential window 0–1.0 V for charge–discharge	55
MnO_2 nanoparticles	221.2 F g^{-1} at 2 mVs^{-1} in 0.25 M Na_2SO_4	Three	Potential window -0.1–0.9 V for charge–discharge	7
Mn_2O_3 hollow microspheres	1651 F g^{-1} at 0.5 A g^{-1} in 6 M KOH solution	Three	High rate capability, good cyclic stability	9
Porous nanostructured Mn_3O_4	232.5 F g^{-1} at 0.5 A g^{-1} in 1M Na_2SO_4	Three	Potential window 0–1.0 V for charge–discharge	11
Mn-LMOF	1098 F g^{-1} at 1 A g^{-1} in 1 M KOH solution	Three	High rate capability, good cyclic stability	Present study

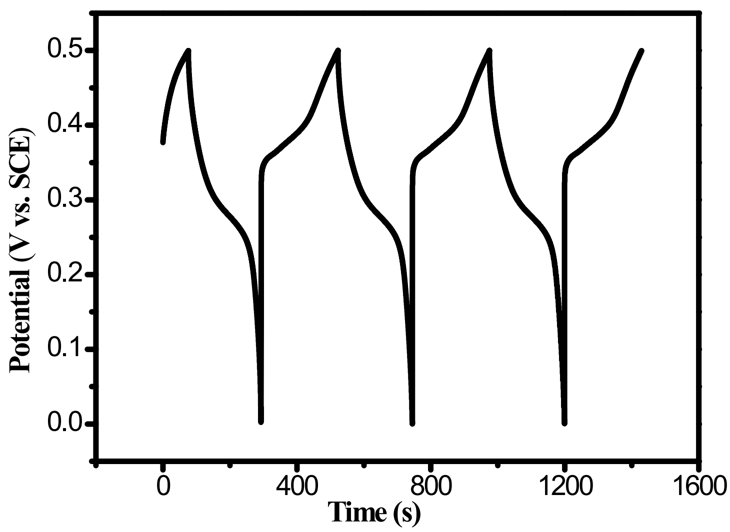

Figure S3 The charge-discharge curves of the Mn−LMOF electrode in KOH solution at a current density of 3A g^{-1}.

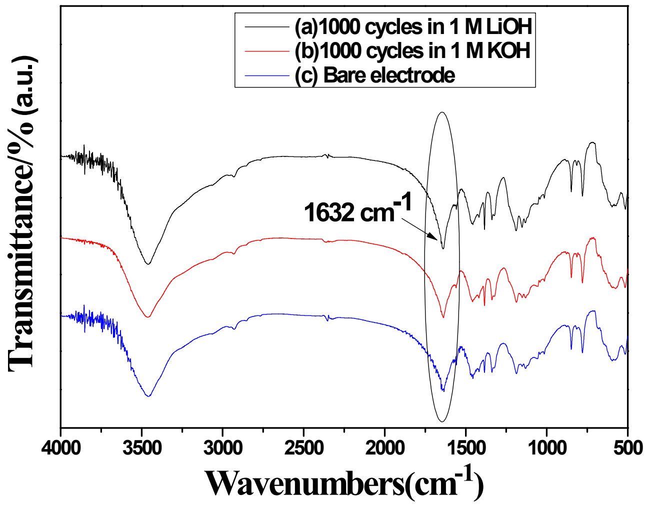

Figure S 4 FT-IR spectra of the Mn−LMOF (a) 1000 cycles in 1 M LiOH, (b) 1000 cycles in 1 M KOH, (c) bare electrode containing Mn−LMOF, acetylene black and PTFE.

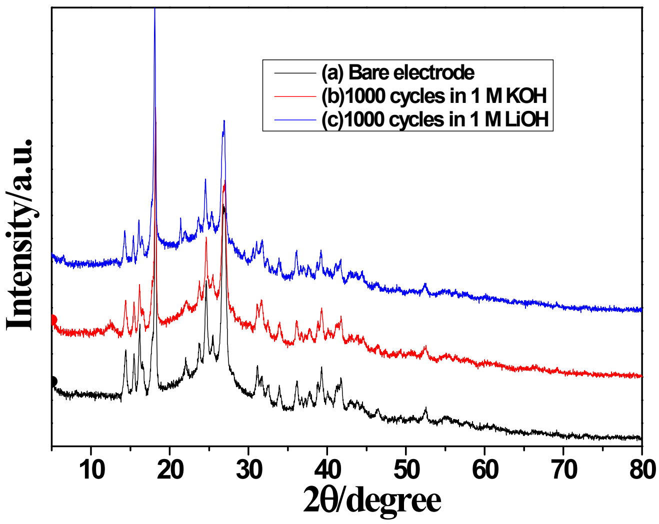

Figure S5 XRD patterns of Mn−LMOF (a) bare electrode containing Mn−LMOF, acetylene black and PTFE, (b) after 1000 cycles in 1 M KOH and (c) 1M LiOH.

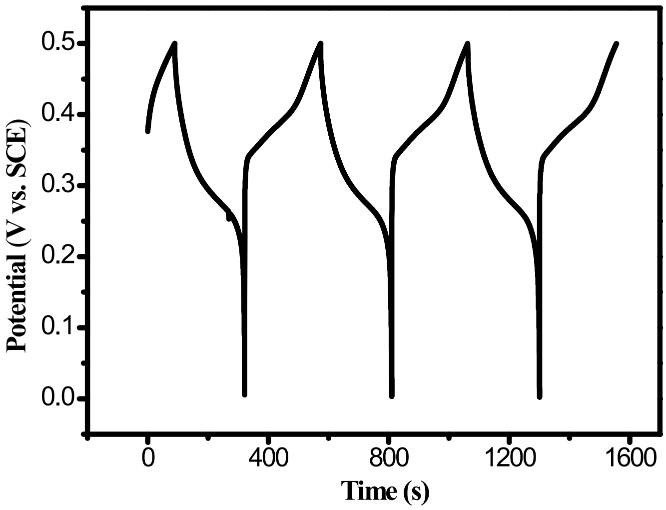

Figure S6 The charge-discharge curves of the Mn−LMOF electrode in LiOH solution at a current density of 3A g^{-1}.