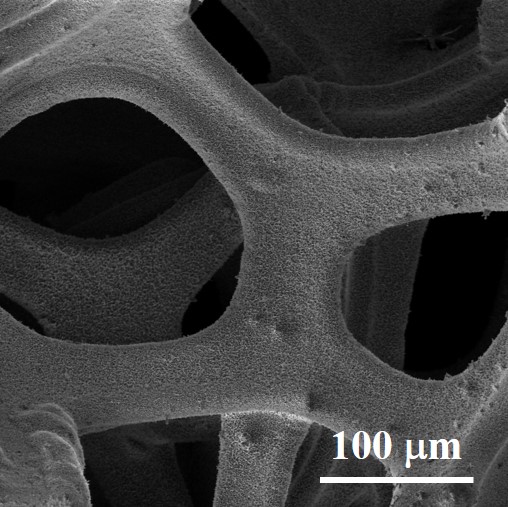
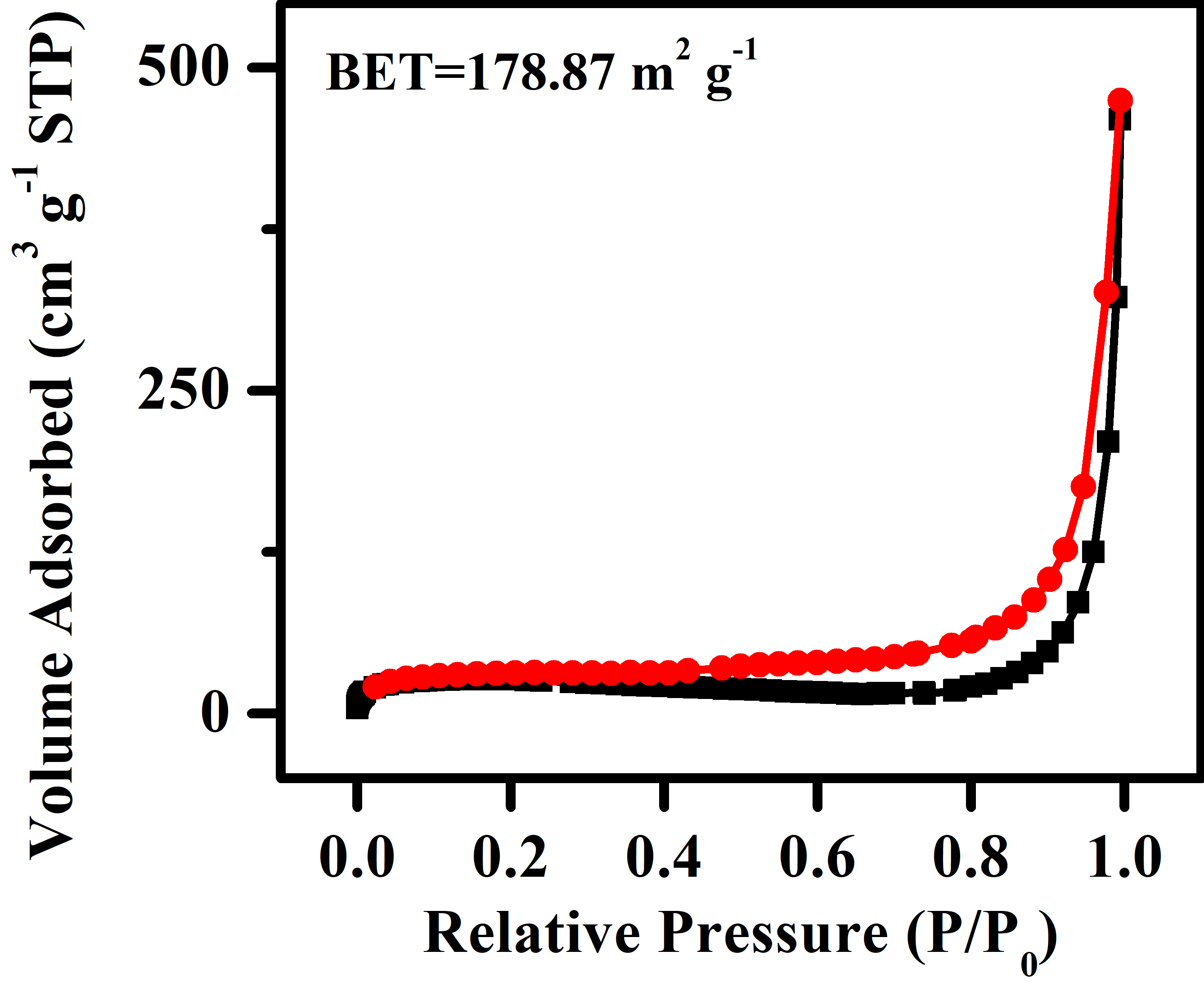
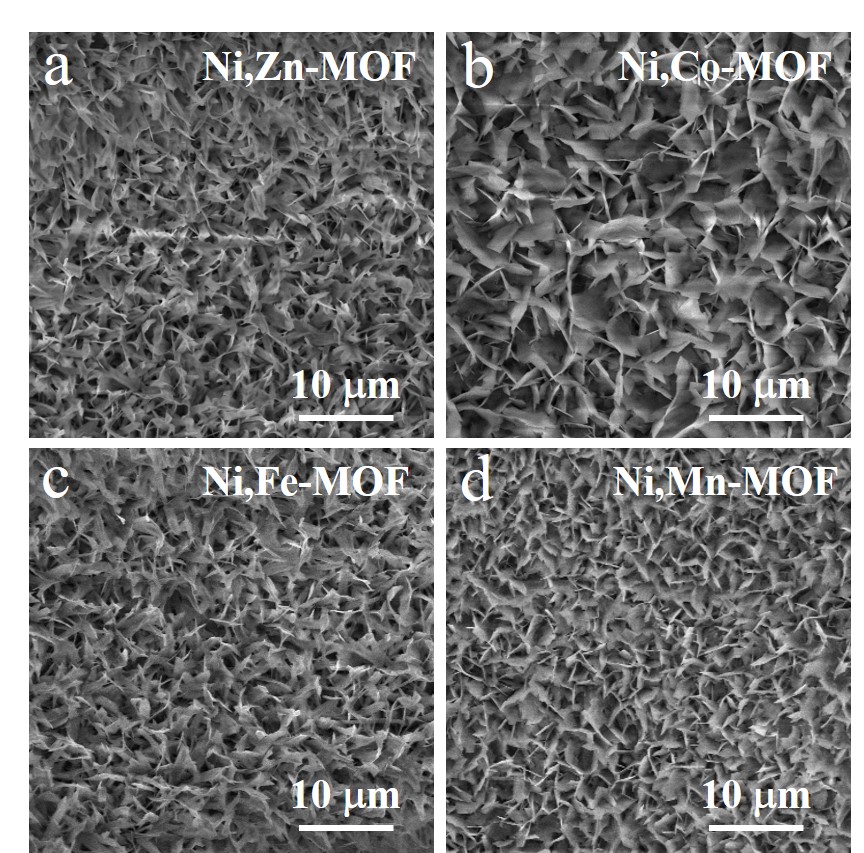
Supplementary Material



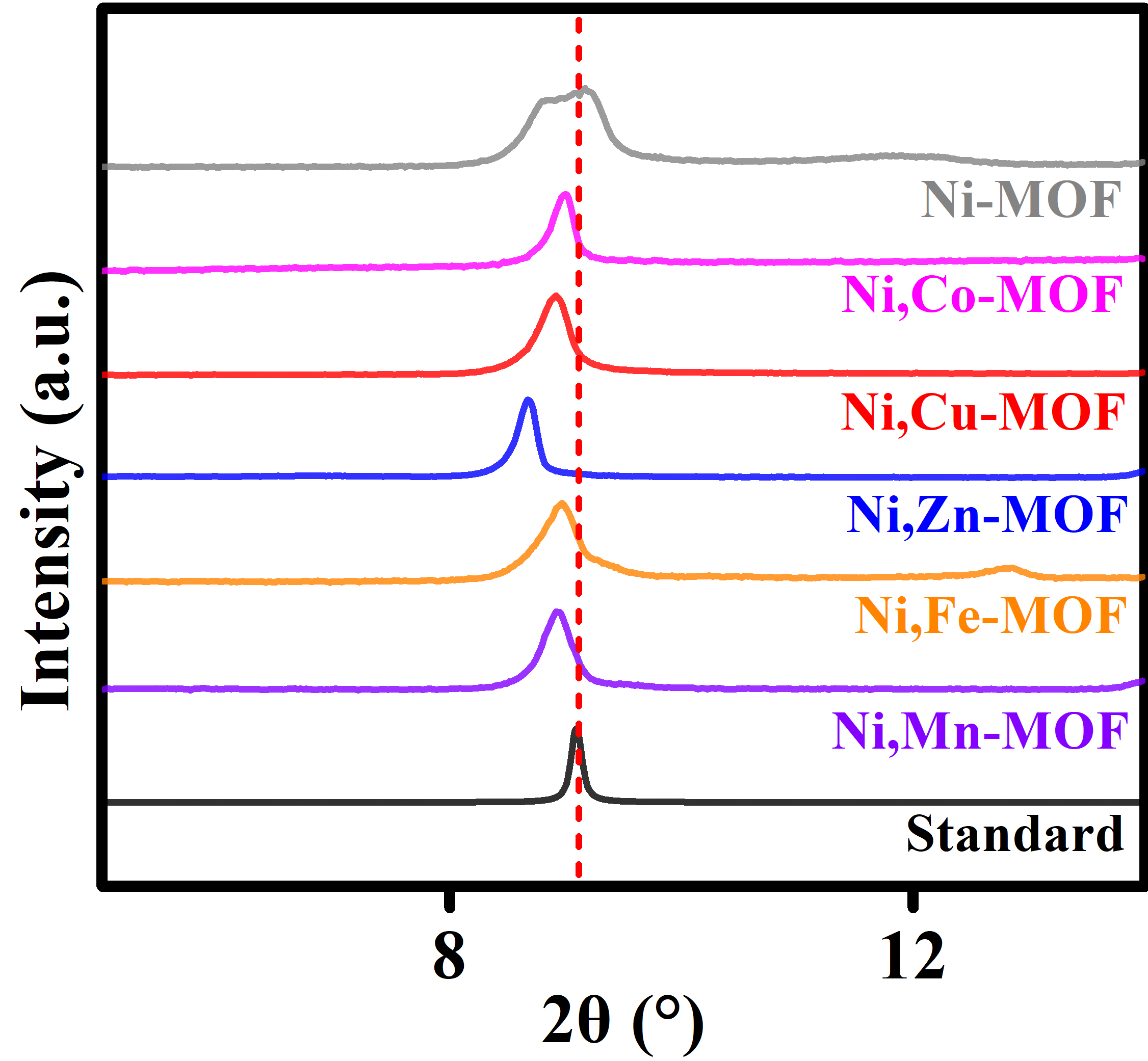
**Supplementary Figure 1.** SEM image of the nickel foam after reaction.



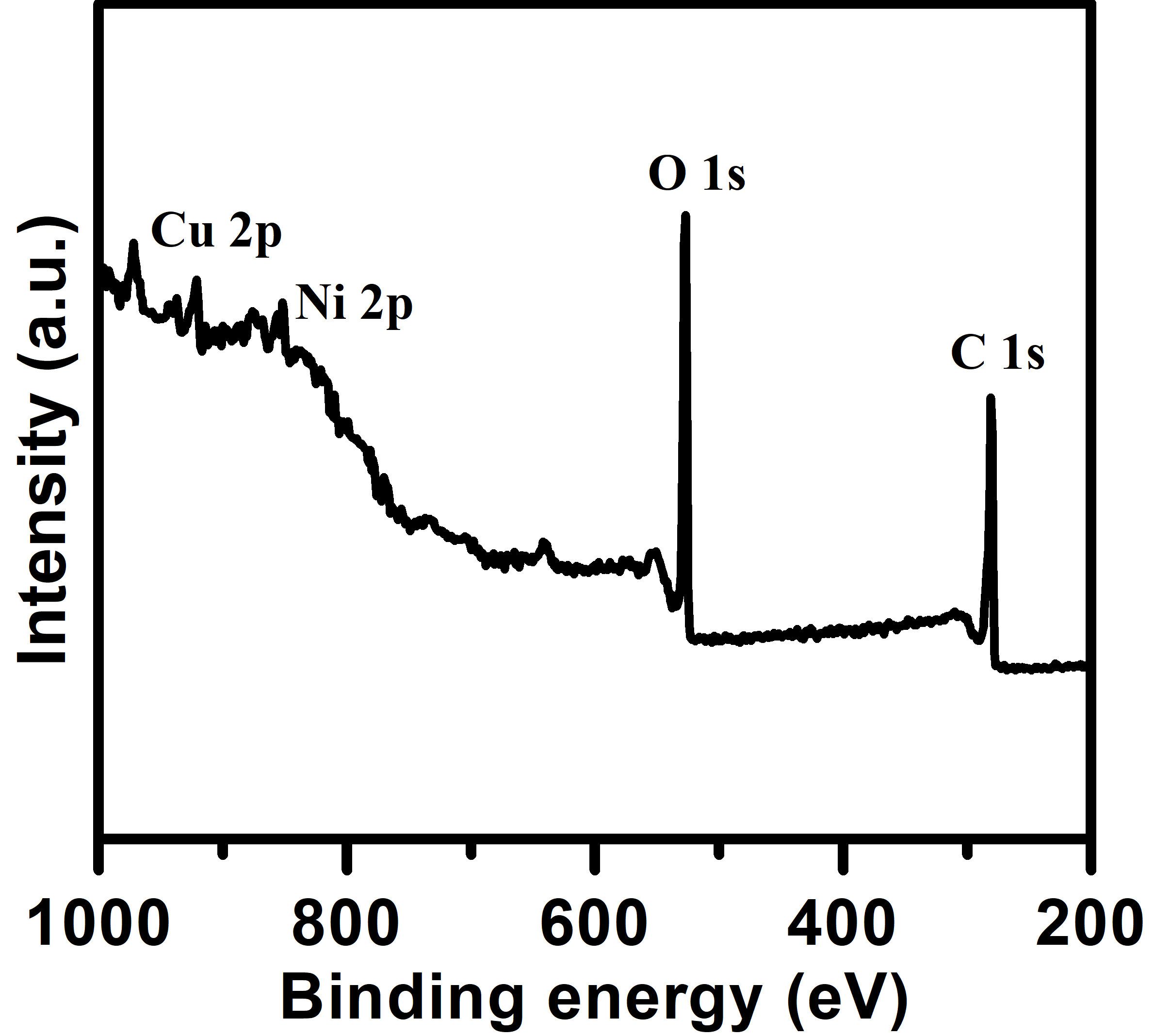
**Supplementary Figure 2.** N2 adsorption isotherms of the Ni,Cu-MOF sample.



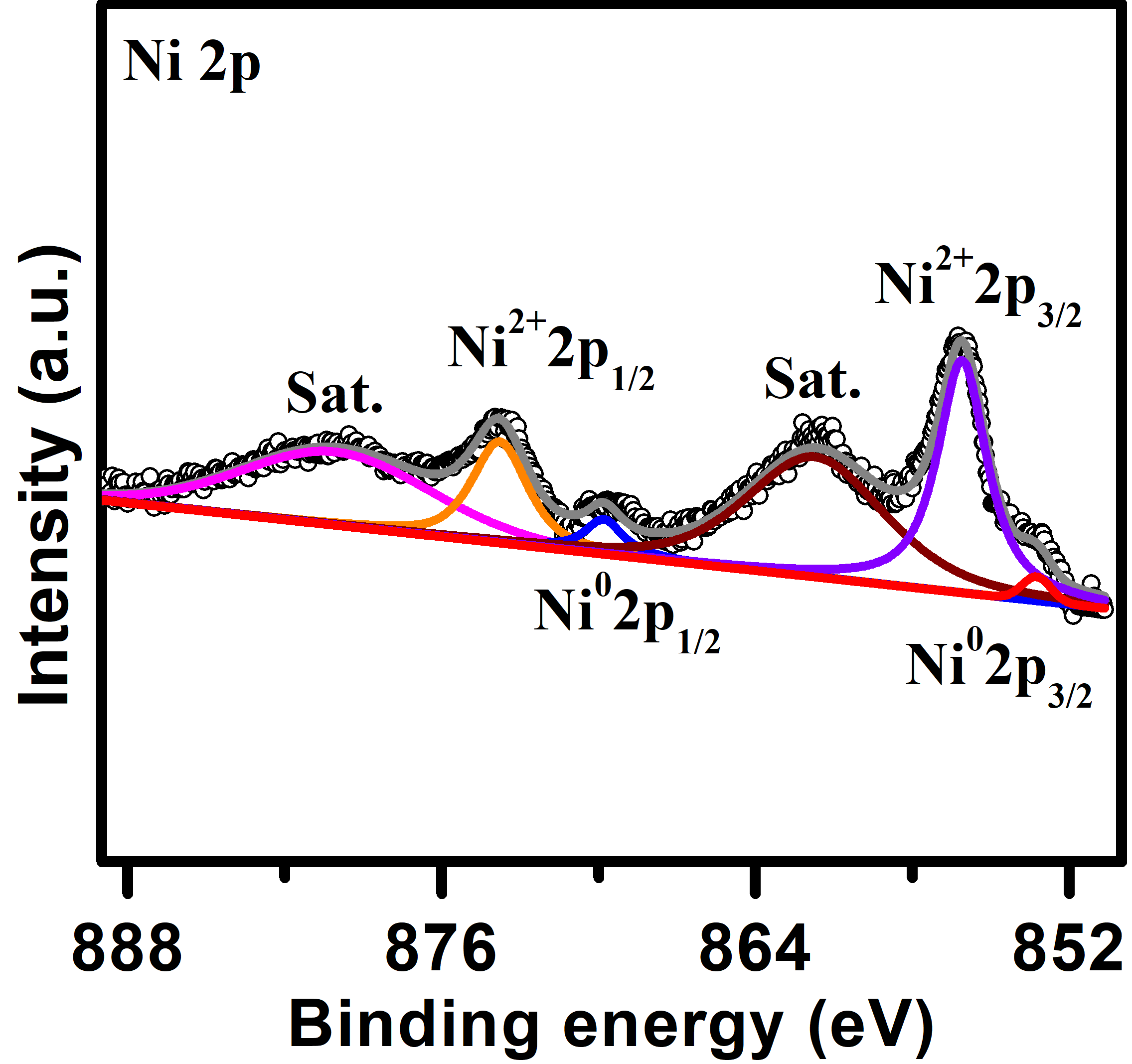
**Supplementary Figure 3.** The SEM images of the Ni,Zn-MOF, Ni,Co-MOF, Ni,Fe-MOF and Ni,Mn-MOF samples.



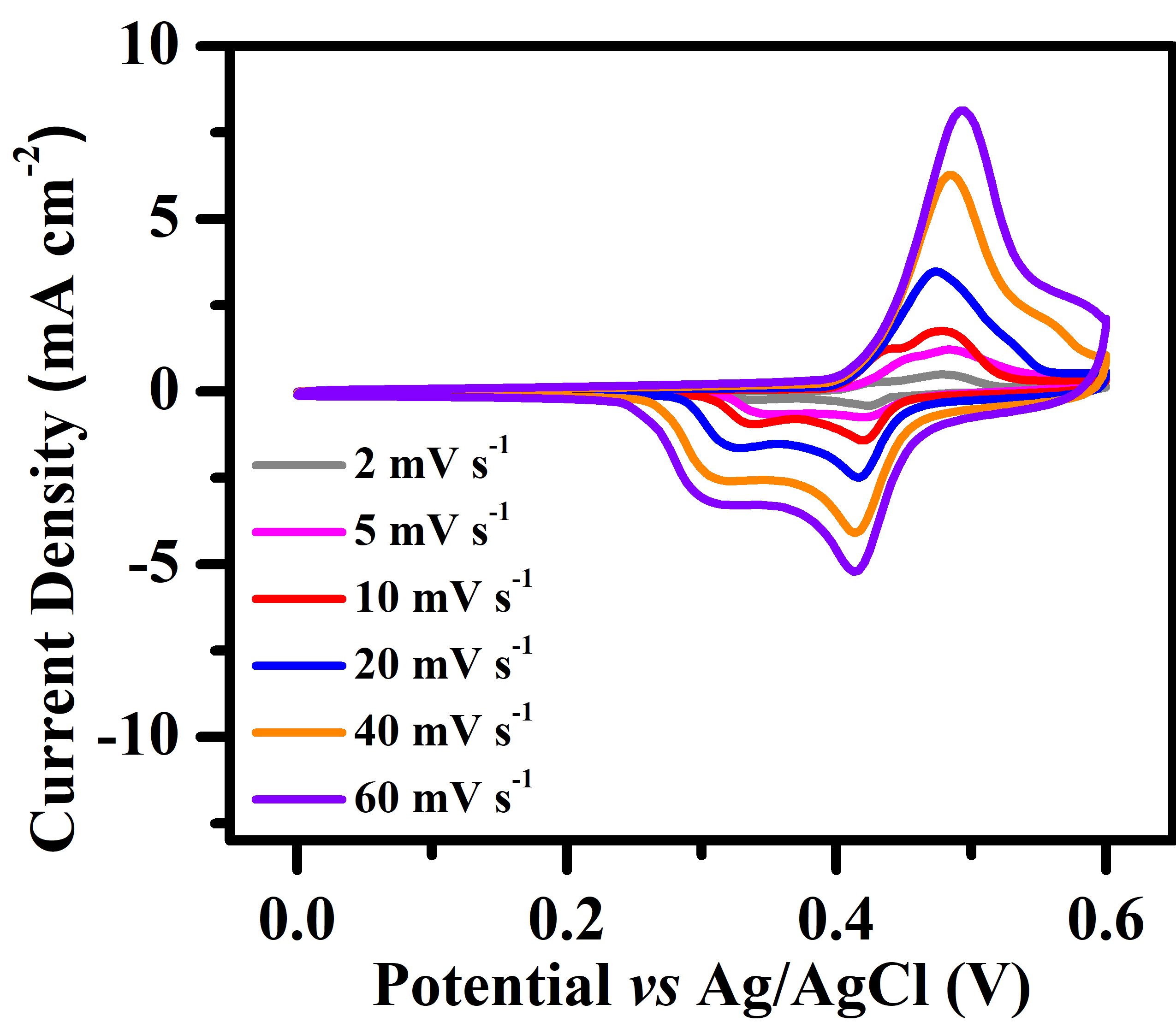
**Supplementary Figure 4.** Magnification of the XRD patterns of all samples.



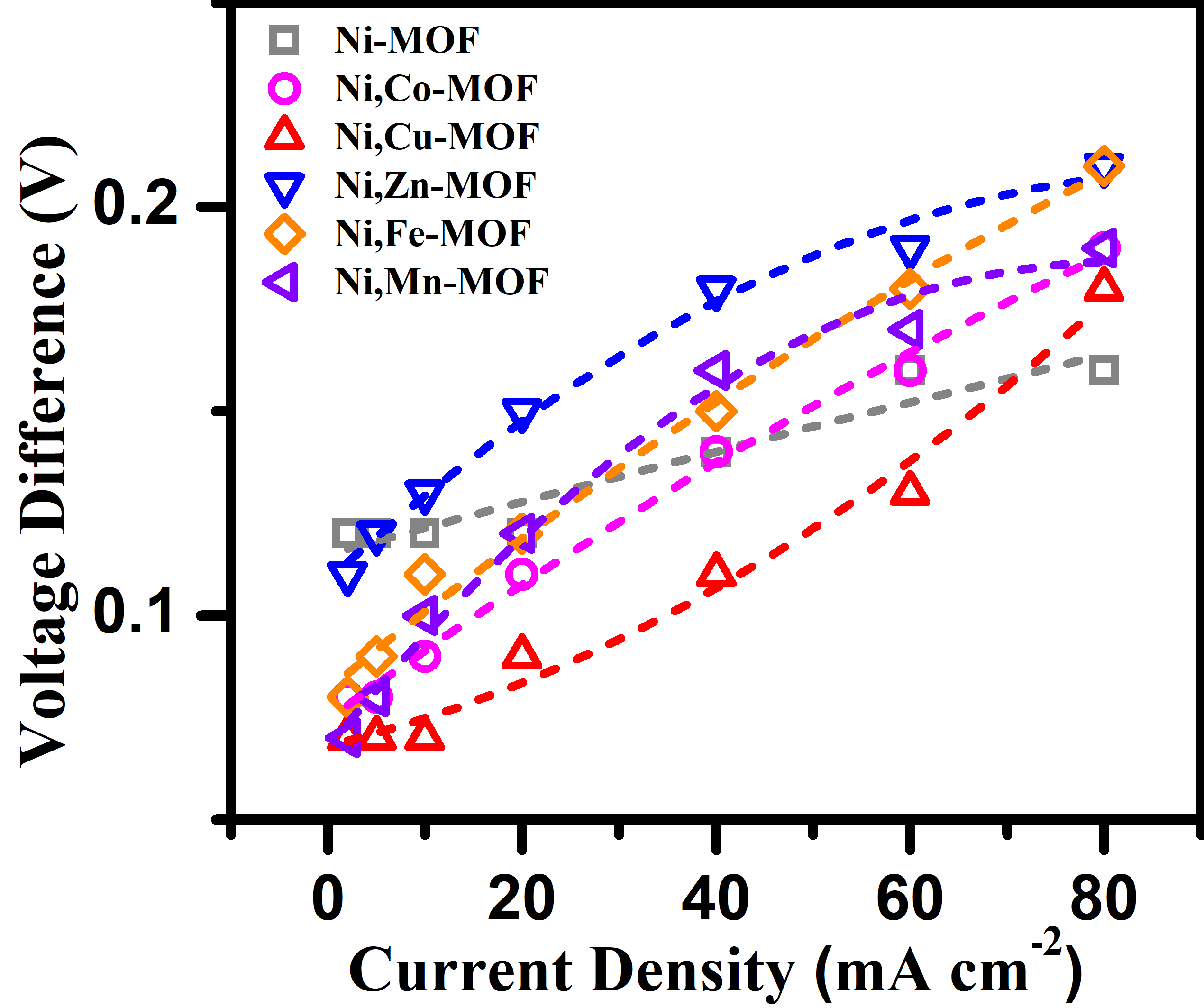
**Supplementary Figure 5.** The XPS survey spectra of the Ni,Cu-MOF sample

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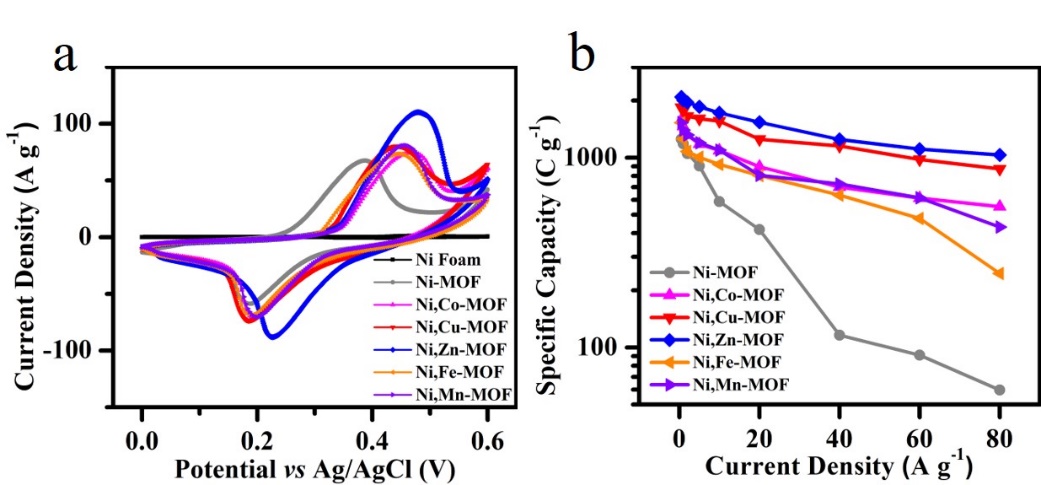
**Supplementary Figure 6.** High-resolution XPS spectra of Ni 2p for nickel foam.

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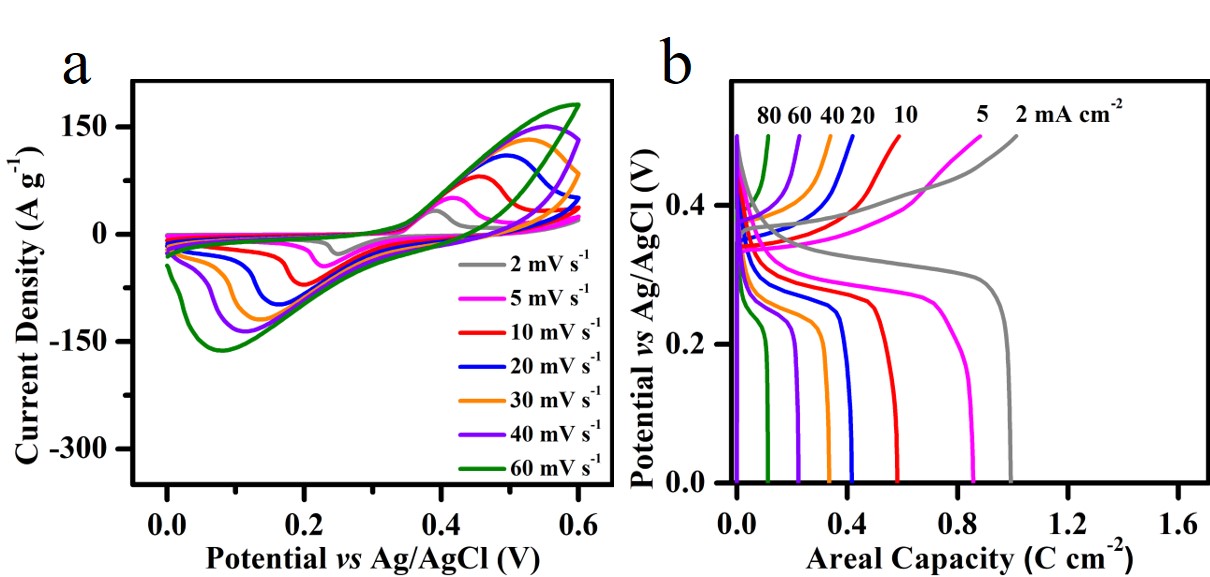
**Supplementary Figure 7.** CV curves of nickel foam in the potential range from 0 to 0.6 V at the scan rate from 2 mV s-1 to 60 mV s−1.



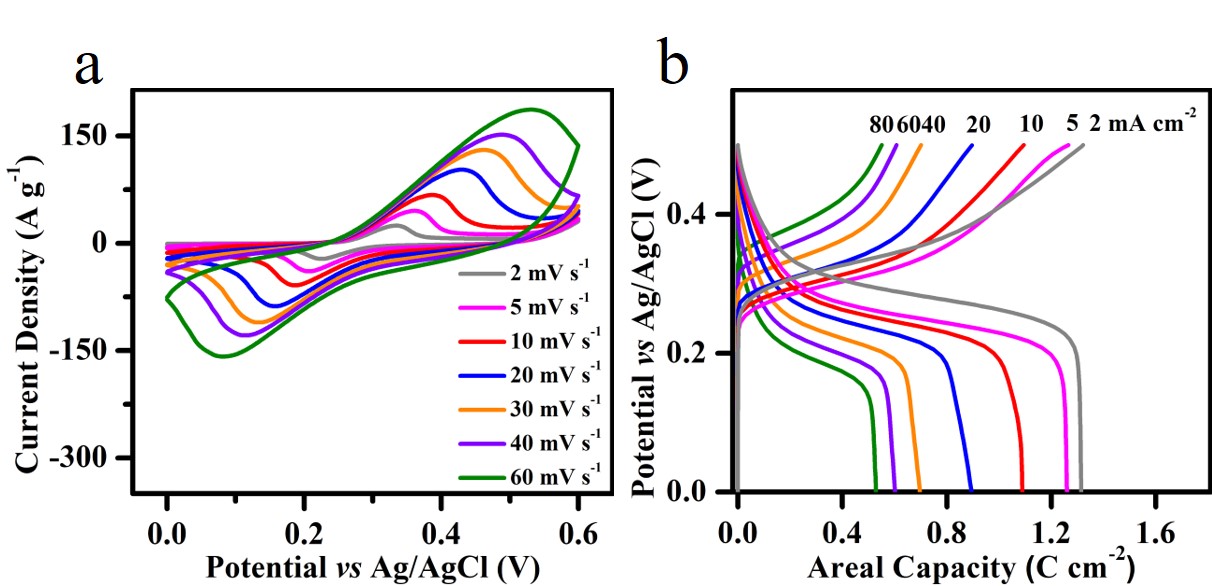
**Supplementary Figure 8.** The voltage difference between the charging and discharging platforms of all samples in three-electrode system.



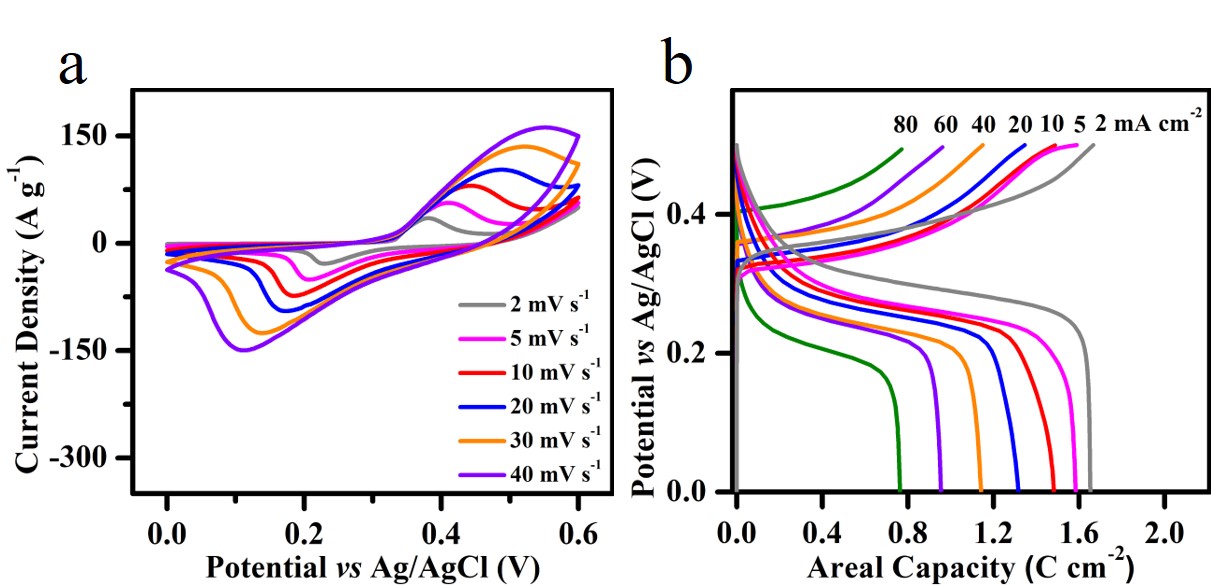
**Supplementary Figure 9.** (a) CV curves based on the mass of the Ni foam, Ni-MOF, Ni,Co-MOF, Ni,Cu-MOF, Ni,Zn-MOF, Ni,Fe-MOF and Ni,Mn-MOF, respectively. (b) Rate performance of all samples.



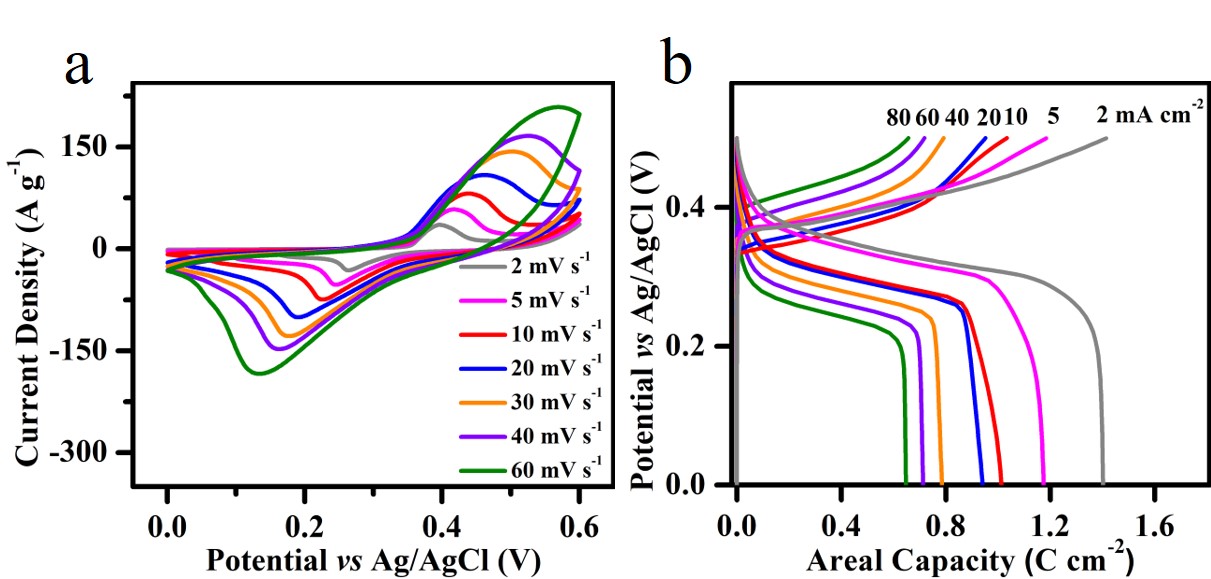
**Supplementary Figure 10.** (a) CV curves of the Ni-MOF. (b) Charge–discharge curves from 2 mA cm-2 to 80 mA cm-2.



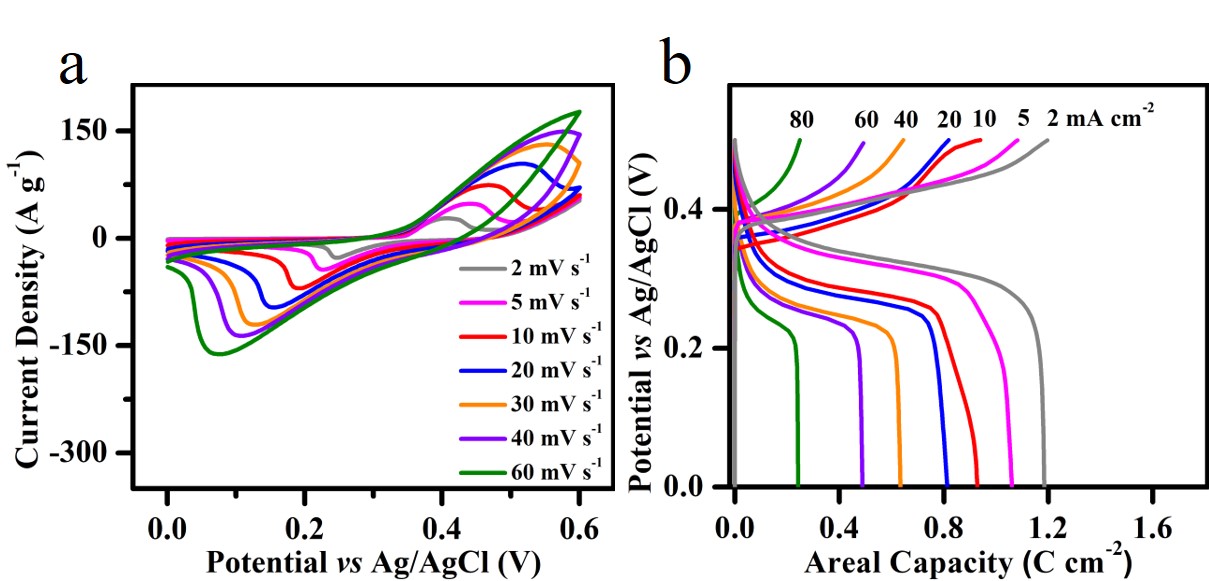
**Supplementary Figure 11.** (a) CV curves of the Ni,Co-MOF. (b) Charge–discharge curves from 2 mA cm-2 to 80 mA cm-2.



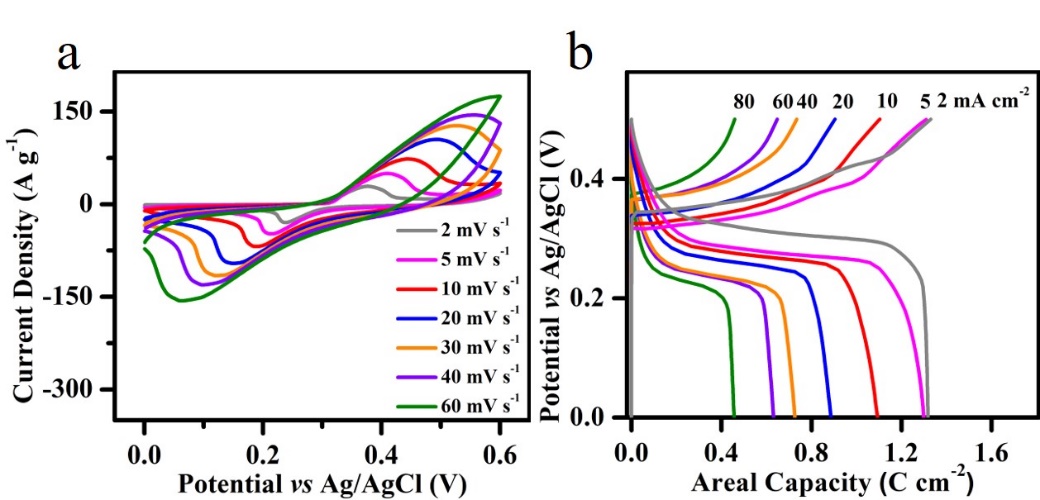
**Supplementary Figure 12.** (a) CV curves of the Ni,Cu-MOF. (b) Charge–discharge curves from 2 mA cm-2 to 80 mA cm-2.



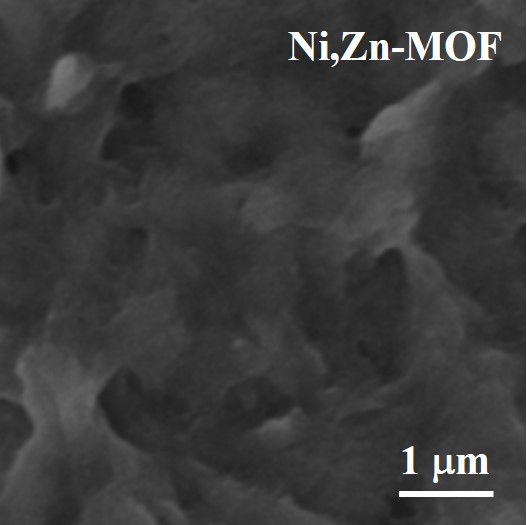
**Supplementary Figure 13.** (a) CV curves of the Ni,Zn-MOF. (b) Charge–discharge curves from 2 mA cm-2 to 80 mA cm-2.



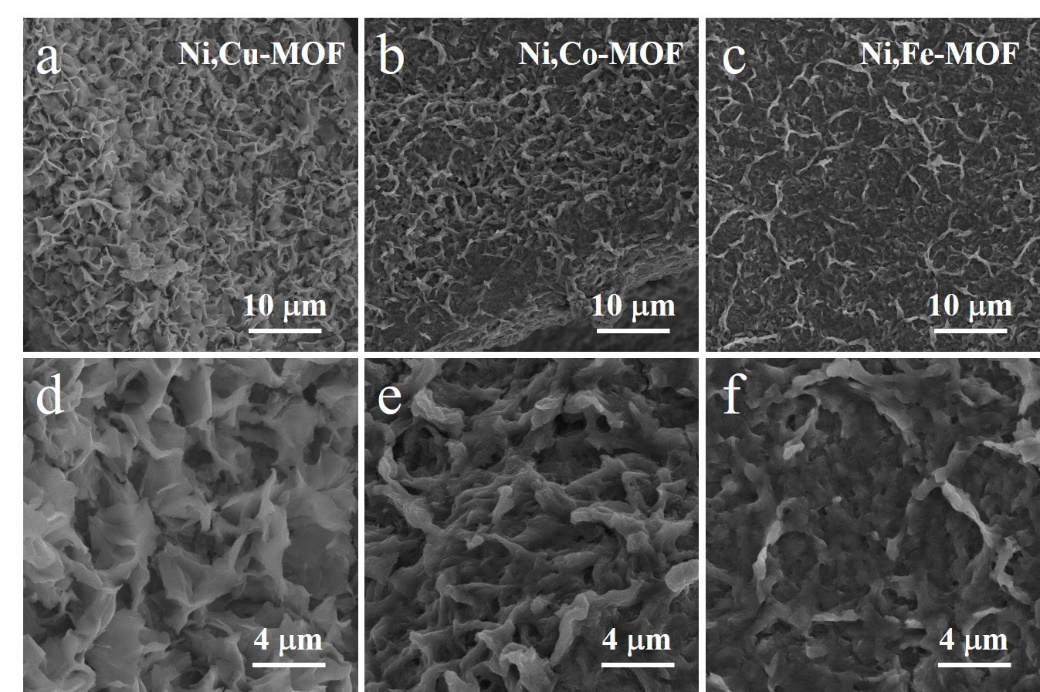
**Supplementary Figure 14.** (a) CV curves of the Ni,Fe-MOF. (b) Charge–discharge curves from 2 mA cm-2 to 80 mA cm-2.



**Supplementary Figure 15.** (a) CV curves of the Ni,Mn-MOF. (b) Charge–discharge curves from 2 mA cm-2 to 80 mA cm-2.



**Supplementary Figure 16.** The SEM image of the Ni,Zn-MOF electrode after cycling test.



**Supplementary Figure 17.** The SEM images of the Ni,Cu-MOF, Ni,Co-MOF and Ni,Fe-MOF electrode after cycling test.