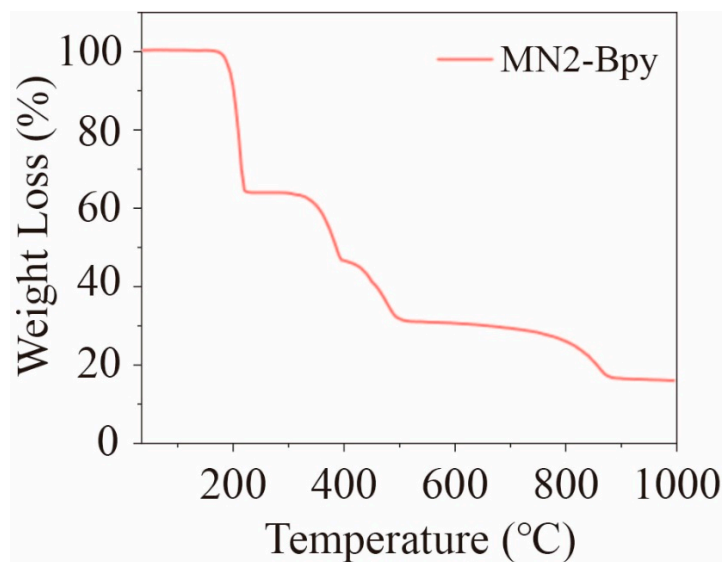


# Metal–Organic Framework–derived Mn/Ni Dual–Metal Single–Atom Catalyst for Efficient Oxygen Reduction Reaction

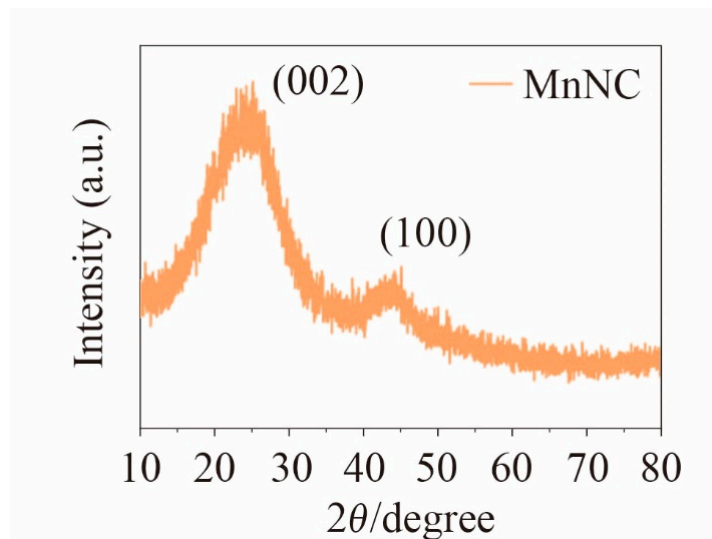
Zewen Sun <sup>1,2</sup>, Siyuan Zhang <sup>2</sup>, Bo Zheng <sup>2</sup>, Yue Zhou <sup>2</sup>, Wenshu Chen <sup>2</sup>, Rui Liu <sup>1,\*</sup>, Guangxiang Liu <sup>2,\*</sup>, Leiming Lang <sup>2,\*</sup>

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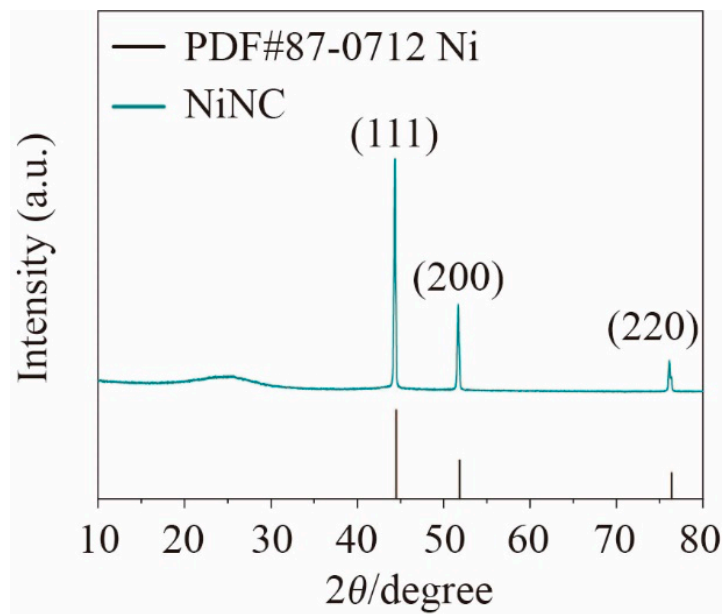
<sup>2</sup>Laboratory of Advanced Functional Materials of Nanjing, Nanjing Xiaozhuang University, Nanjing, 211171, China.



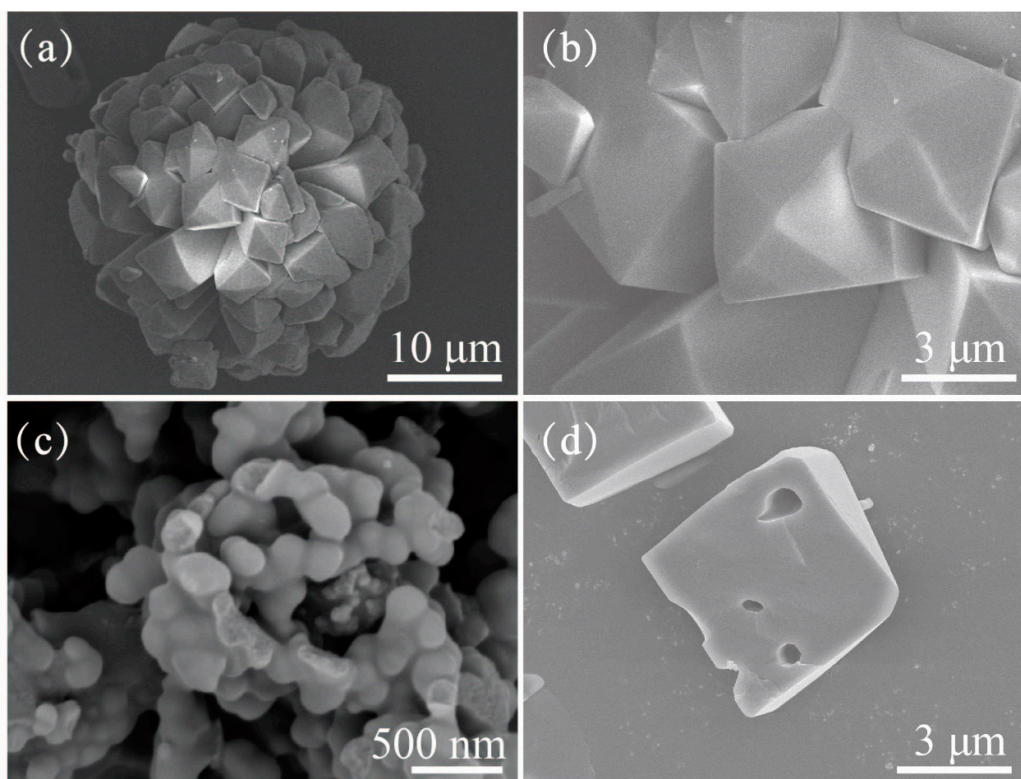
**Figure S1** TGA plots of MnNi-Bpy-2.



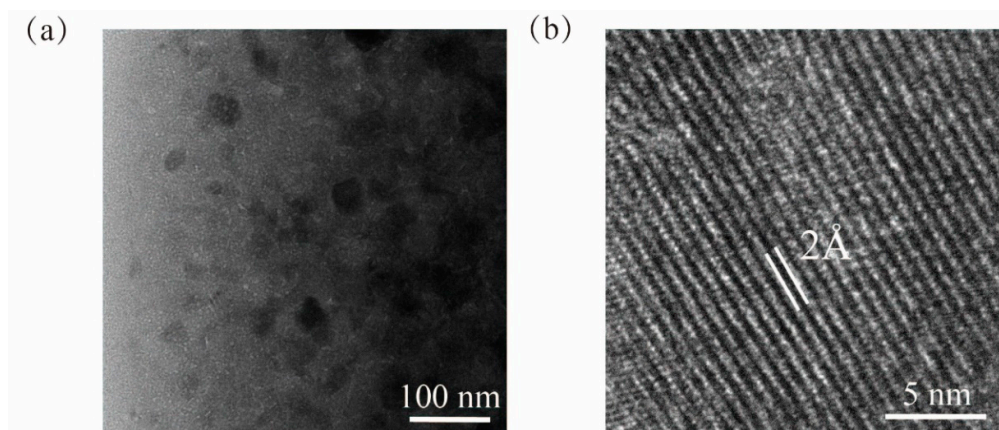
**Figure S2** XRD pattern of MnNC.



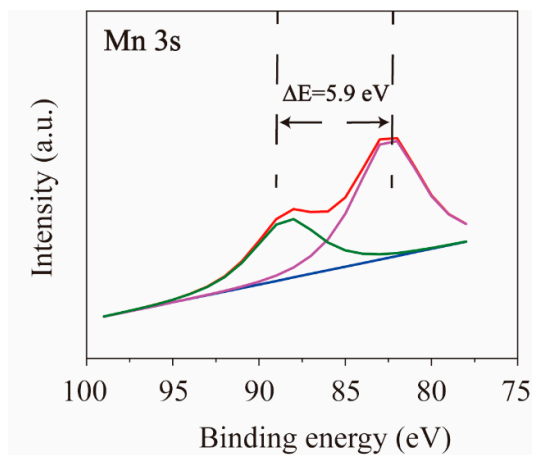
**Figure S3** XRD pattern of NiNC.



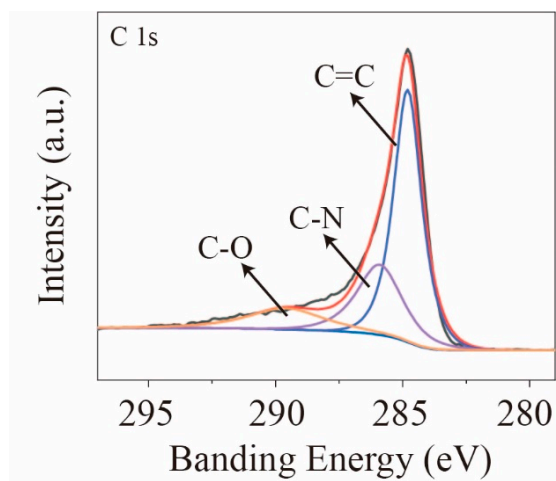
**Figure S4** SEM images of (a, b) MnNi-Bpy-2, (c) Ni-Bpy and (d) Mn-Bpy.



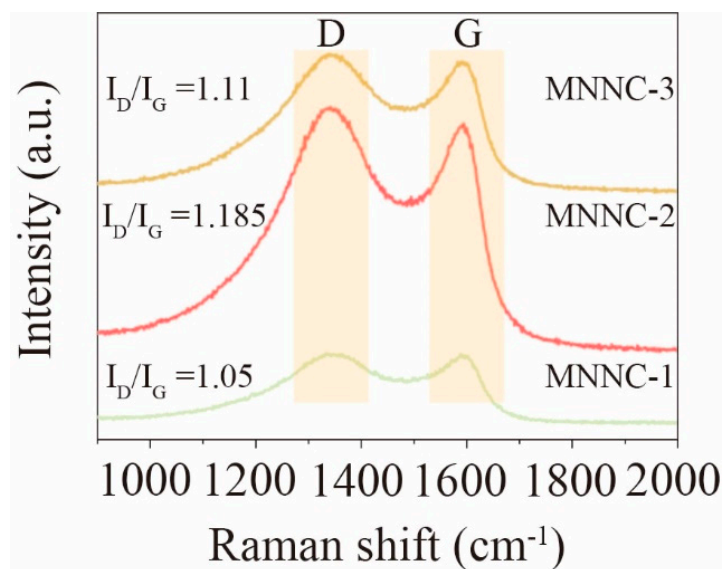
**Figure S5** TEM images of MNNC-2 without acid washing.



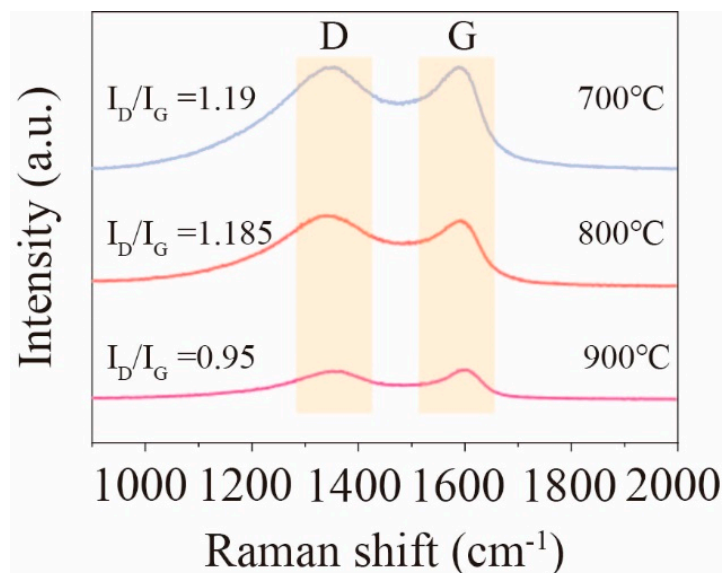
**Figure S6** High-resolution Mn 3s XPS spectra of MNNC-2



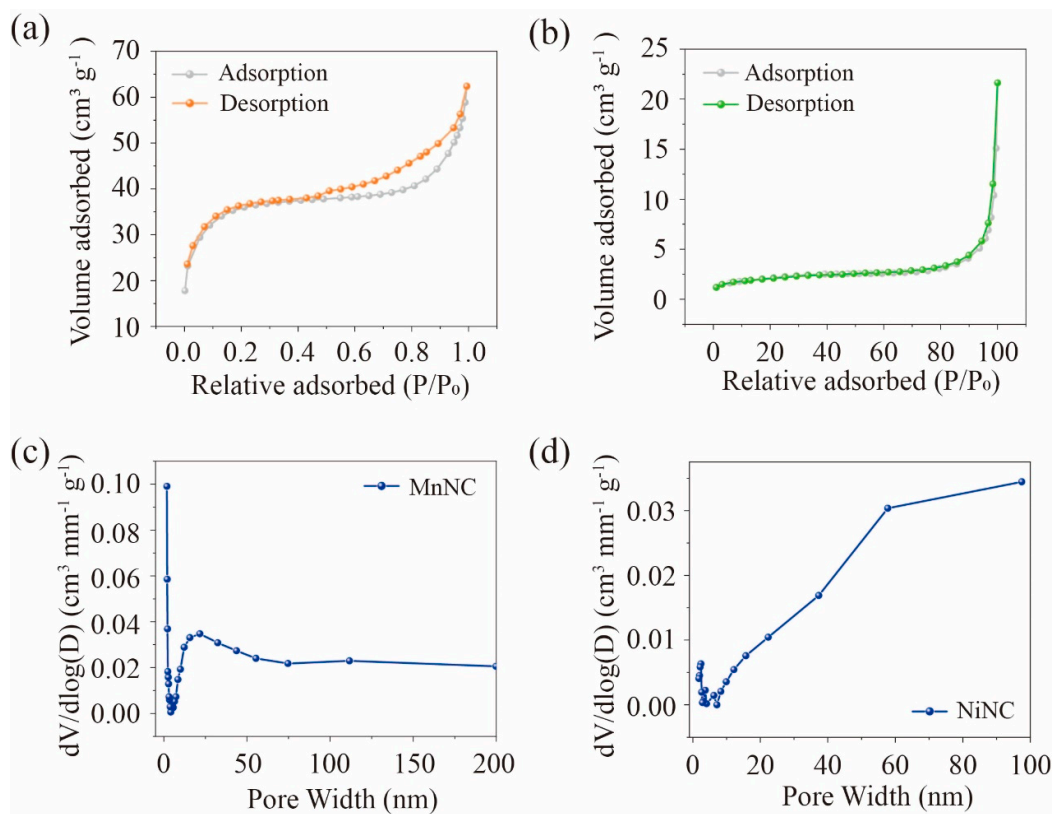
**Figure S7** High-resolution C 1s XPS spectra of MNNC-2



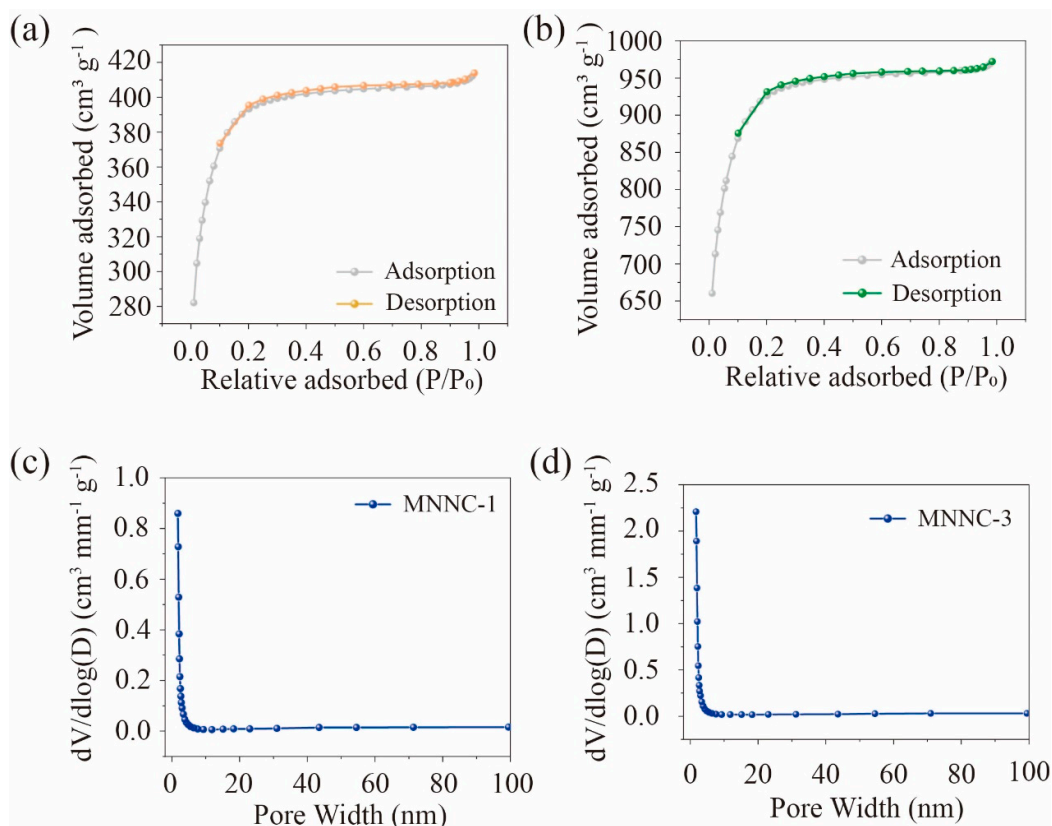
**Figure S8** Raman spectra of MNNC-1, MNNC-2 and MNNC-3.



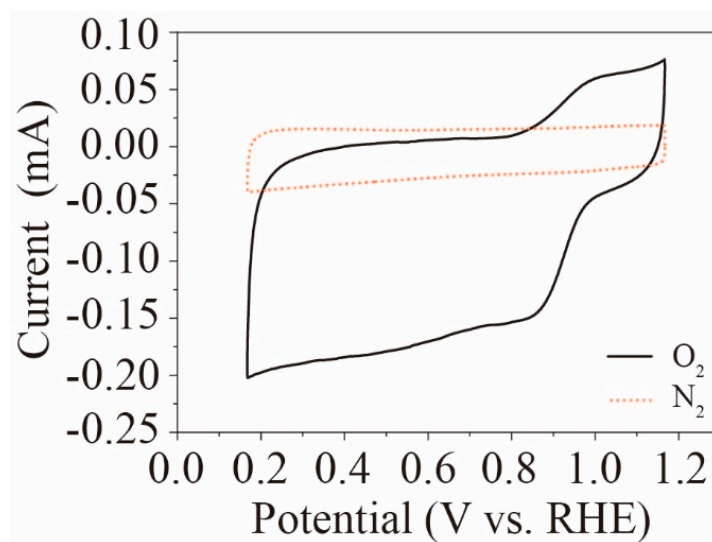
**Figure S9** Raman spectra of MNNC-2 carbonized at 700 °C, 800 °C and 900 °C.



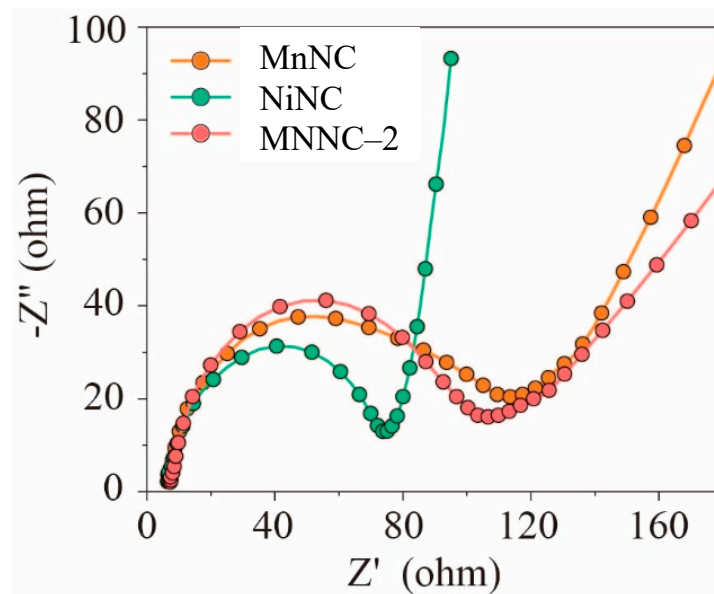
**Figure S10** N<sub>2</sub> adsorption-desorption isotherms and corresponding pore size distribution plots of MnNC (a and c) and NiNC (b and d).



**Figure S11** N<sub>2</sub> adsorption-desorption isotherms and corresponding pore size distribution plots of MNNC-1 (a and c) and MNNC-3 (b and d).



**Figure S12** CV curves for MNNC-2 in O<sub>2</sub>- or N<sub>2</sub>-saturated 0.1 M KOH at a scan rate of 10 mV s<sup>-1</sup>.



**Figure S13** Nyquist plots of MnNC, NiNC and MNNC-2 catalysts.