Supporting Information

Ruthenium-doped NiFe-based metal-organic framework nanoparticles as highly efficient catalyst for oxygen evolution reaction

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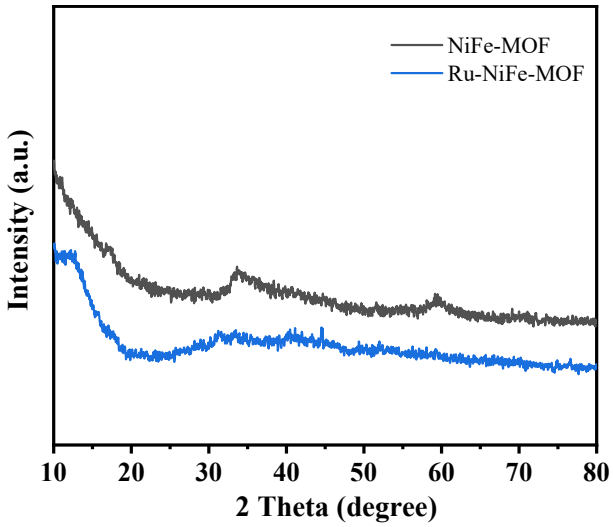

Fig. S1XRD patterns of as-synthetizedNiFe-MOF and Ru-NiFe-MOF.

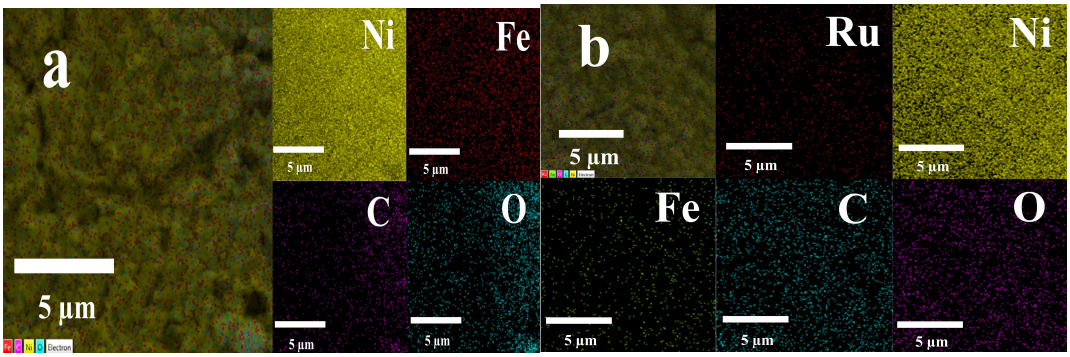

Fig. S2 Elemental mappingof (a) NiFe-MOF/NF and(b)Ru-NiFe-MOF/NF.

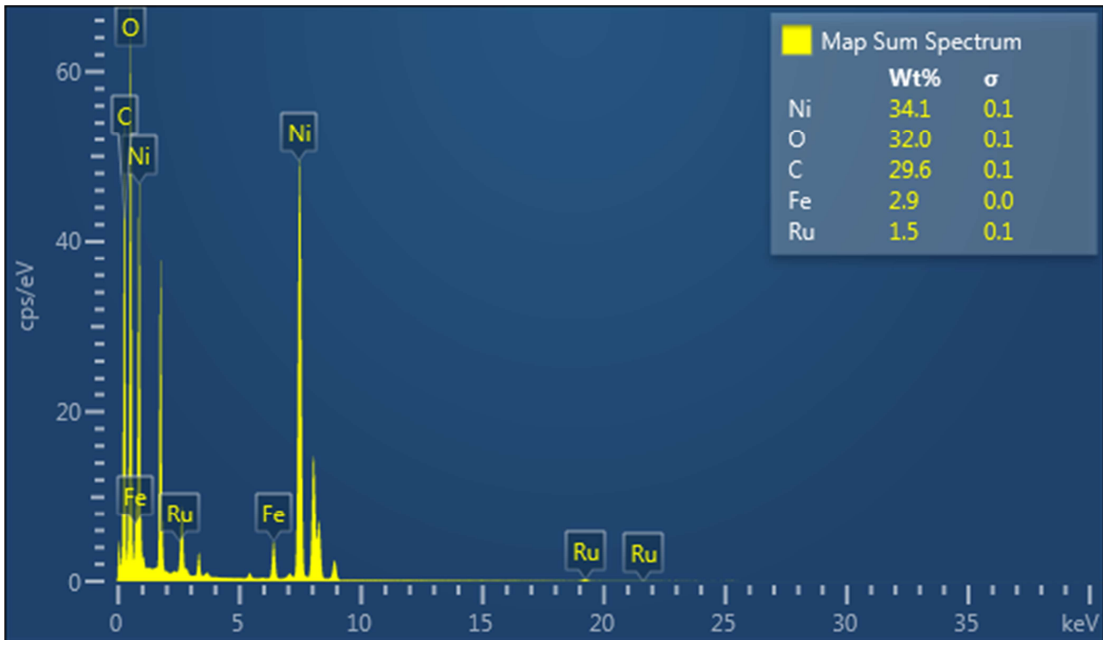

Fig. S3EDX spectrum of Ru-NiFe-MOF.

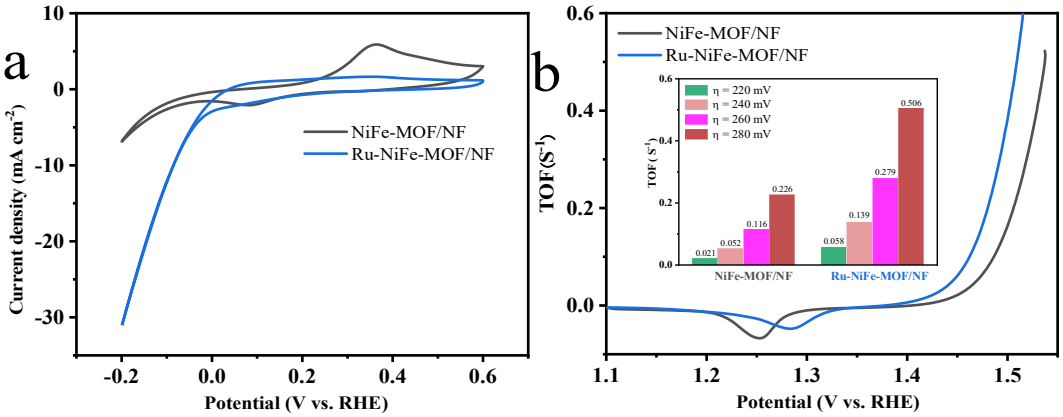

Fig. S4 (a) CV curves of NiFe-MOF/NF and Ru-NiFe-MOF/NFcatalystsin thepotential range from-0.2 to 0.6 V (vs. RHE)in 1 M PBS (pH=7) with scan rate of 50 mVs^{-1}. (b) Calculated TOFs ofNiFe-MOF/NF and Ru-NiFe-MOF/NF for OER (inset shows the corresponding TOFs at special overpotentials of220, 240, 260, and 280 mV, respectively).

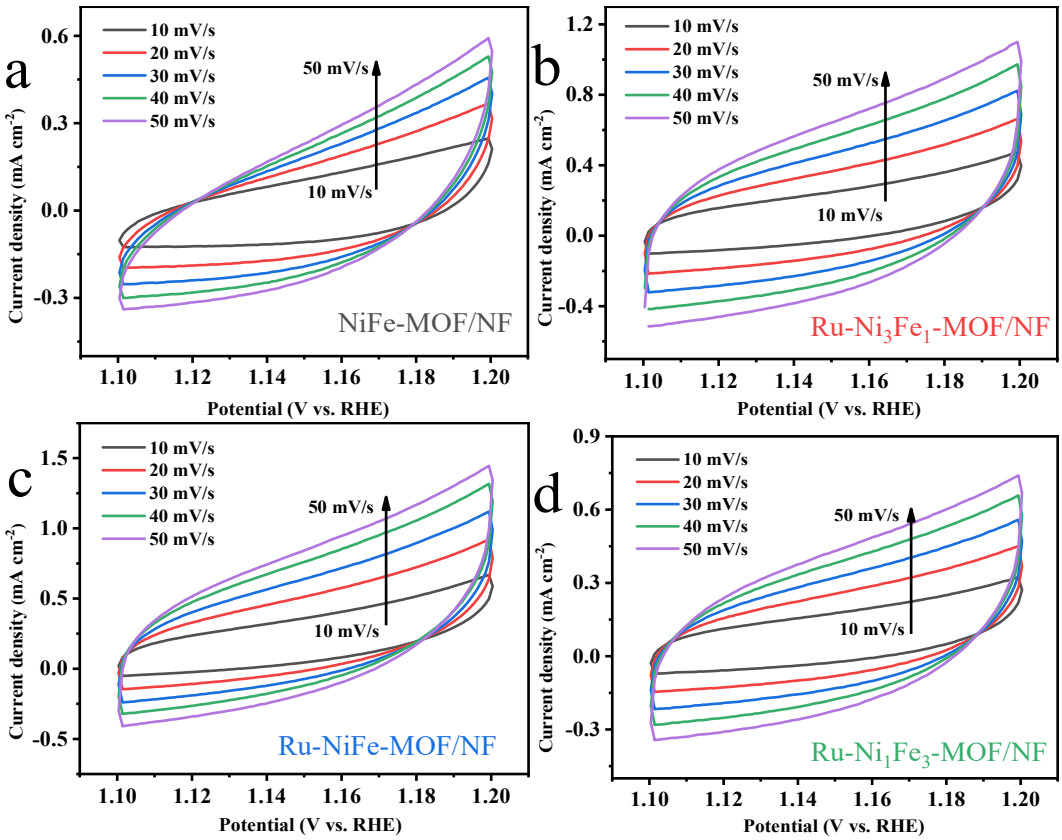

Fig.S5CV curves of (a)NiFe-MOF/NF,(b) Ru-Ni_3Fe_1-MOF/NF,(c) Ru-NiFe-MOF/NF, and (d) Ru-Ni_1Fe_3-MOF/NFcatalystswith various scan rates (10, 20, 30, 40, and 50 mV/s) toward OER 1 M KOH.

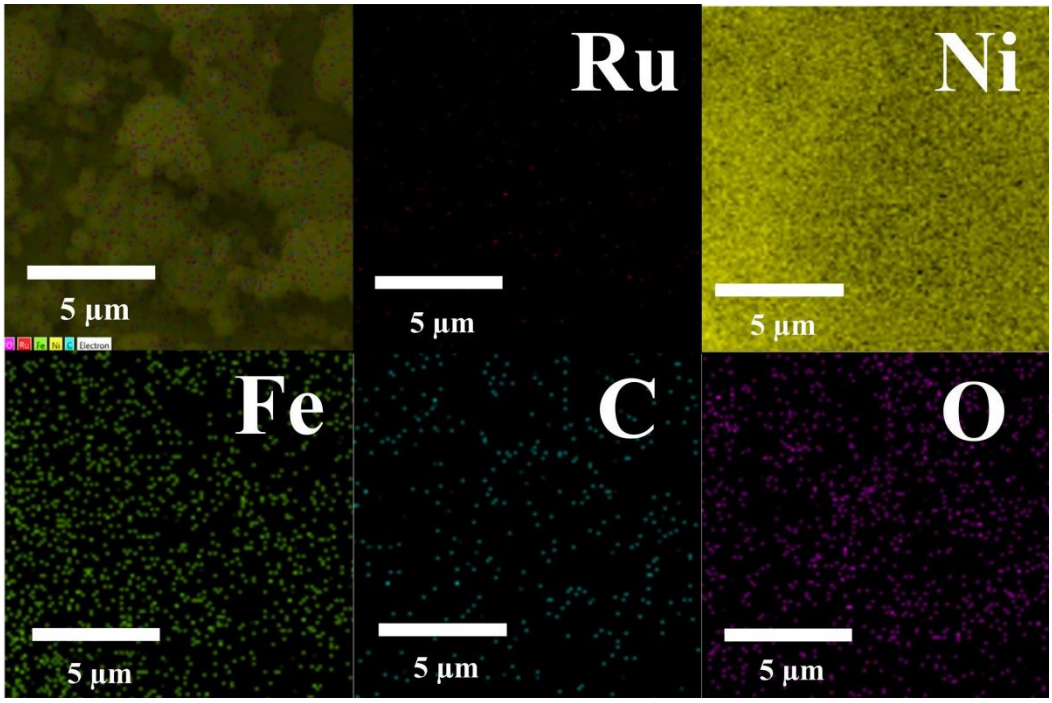

Fig.S6EDX elemental mapping of Ru-NiFe-MOF/NF after long-term stability test.

Table S1 Comparison of electrochemical OER performance ofRu-NiFe-MOF/NFwithotherreported Ru-basedcatalysts in 1 M KOH.

Catalysts	Overpotential at 10 $mAcm^{-2}$(mV)	Tafel slope ($mV\ dec^{-1}$)	Stability (h)	Reference
NiFe-MOF/NF	232	61	—	This work
Ru-NiFe-MOF/NF	205	50	100	This work
NP-Ru_3	245	15	15	*J. Mater. Sci. Technol.* **2021**,70,197-204
e-$Ni_{0.6}Ru_{0.4}$@C	250	46	10	*J. Mater. Chem. A***2020**, 8,9049-9057
Ru_2Ni_2SNs/C	310	~40	—	*Nano Energy***2018**, 47, 1-7
Ru/NF-2	330	62	20	*ACS Appl. Mater. Interfaces***2020**, 1236177-36185
Ru-NiCoP	216 mV @ 20 $mAcm^{-2}$	84.5	30	*Appl. Catal., B***2020**,279,119396
RuO_2-NiO	187	36	20	*J. Mater. Chem. A***2020**,8,18945-18954
RuO_2/N-C	280	56	—	*ACS Sustainable Chem. Eng.***2018**, 6, 11529-11535
NiRu@C	250	46	9	*J. Mater. Chem. A***2020**, 8, 9049-9057
Ru/Cu-doped RuO_2	241	67	6	*Small***2018**, 14, 1803009
RuO_2/Co_3O_4	305	69	—	*RSC Adv.***2017**, 7, 3686