Supporting information

Construction of three-dimensional hierarchical flower-like M(OH)(OCH_3) (M=Co, Cu) microspheres for high efficiency electrocatalytic oxygen evolution

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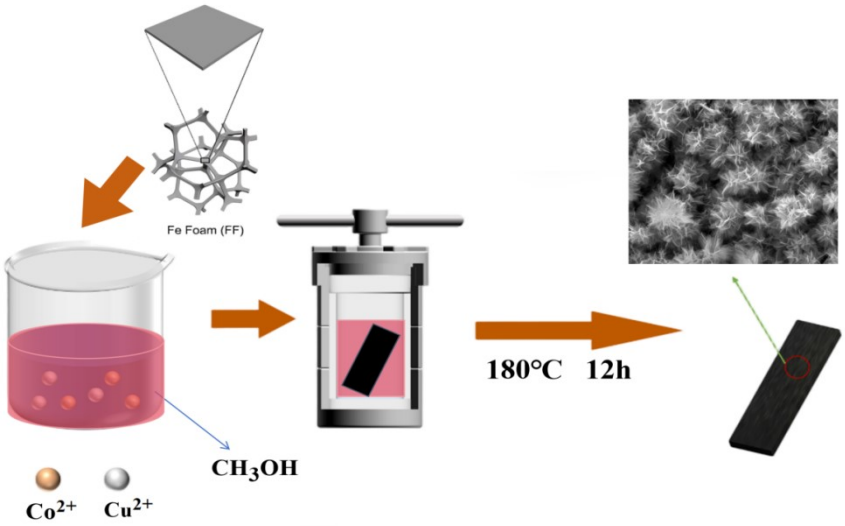

Fig. S1 Schematic diagram of the preparation of CoCuMe.

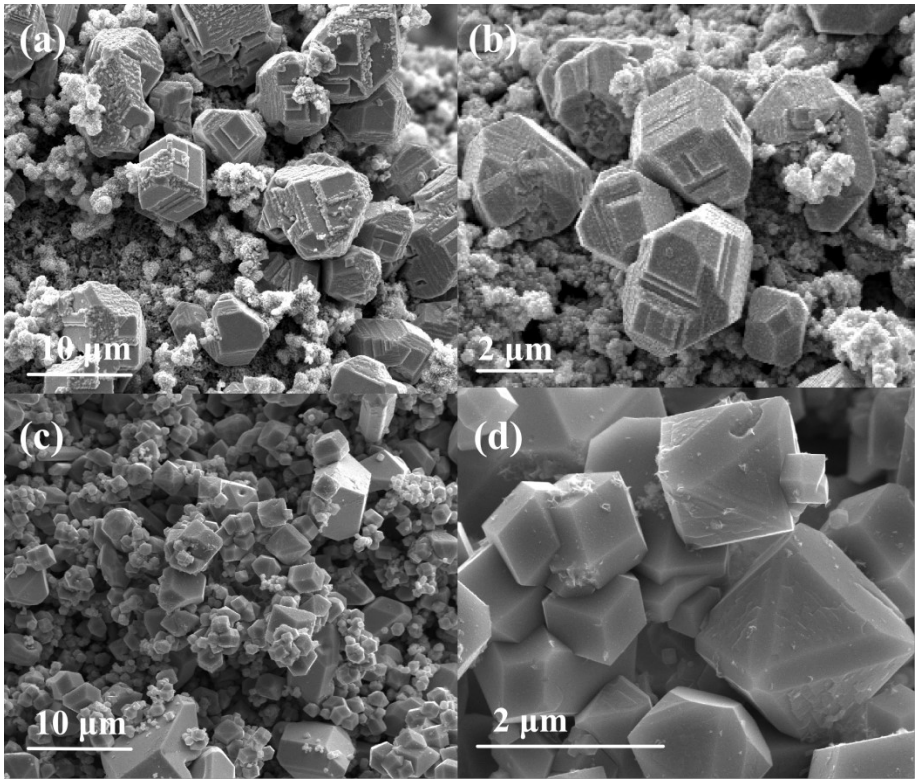

Fig. S2 SEM images of CoMe (a-b) and CuMe (c-d).

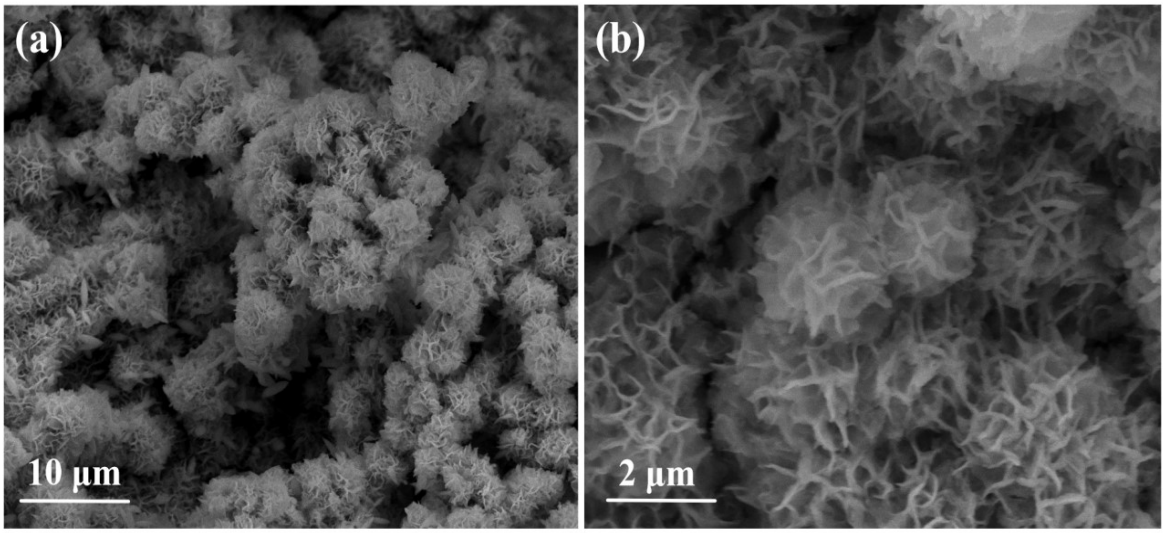

Fig. S3 SEM images of CoCuMe after 100 mA·cm^{-2} for 100 h.

Table S1. The differences of binding energies of CoCuMe, CoMe and CuMe.

	CoCuMe	CoMe	CuMe
Fe^{2+}	709.60 eV	709.48 eV	709.55 eV
Fe^{3+}	711.30 eV	711.10 eV	711.18 eV
Fe^{3+}/Fe^{2+}	1.52:1	1.35:1	1.31:1
Co^{2+} ($2p_{1/2}$)	796.91 eV	796.64 eV	-
Co^{2+} ($2p_{3/2}$)	783.78 eV	782.15 eV	-
Co^{3+} ($2p_{1/2}$)	795.43 eV	795.28 eV	-
Co^{3+} ($2p_{3/2}$)	780.38 eV	780.26 eV	-
Co^{3+}/Co^{2+}	1.74:1	1.45:1	-
Cu^{+} ($2p_{3/2}$)	932.28 eV	-	931.36 eV
Cu^{2+} ($2p_{3/2}$)	934.50 eV	-	933.50 eV
Cu^{+} ($2p_{1/2}$)	952.30 eV	-	951.70 eV
Cu^{2+} ($2p_{1/2}$)	953.60 eV	-	953.45 eV
Cu^{2+}/Cu^{+}	1.91:1	-	1.62:1
M-O	529.31 eV	529.63 eV	529.47 eV
O-H	530.70 eV	530.77 eV	531.19 eV
O_v	531.44 eV	531.50 eV	531.94 eV
H_2O_{ads}	532.18 eV	532.61 eV	532.73 eV
O_V/M-O	2.68:1	2.02:1	2.40:1

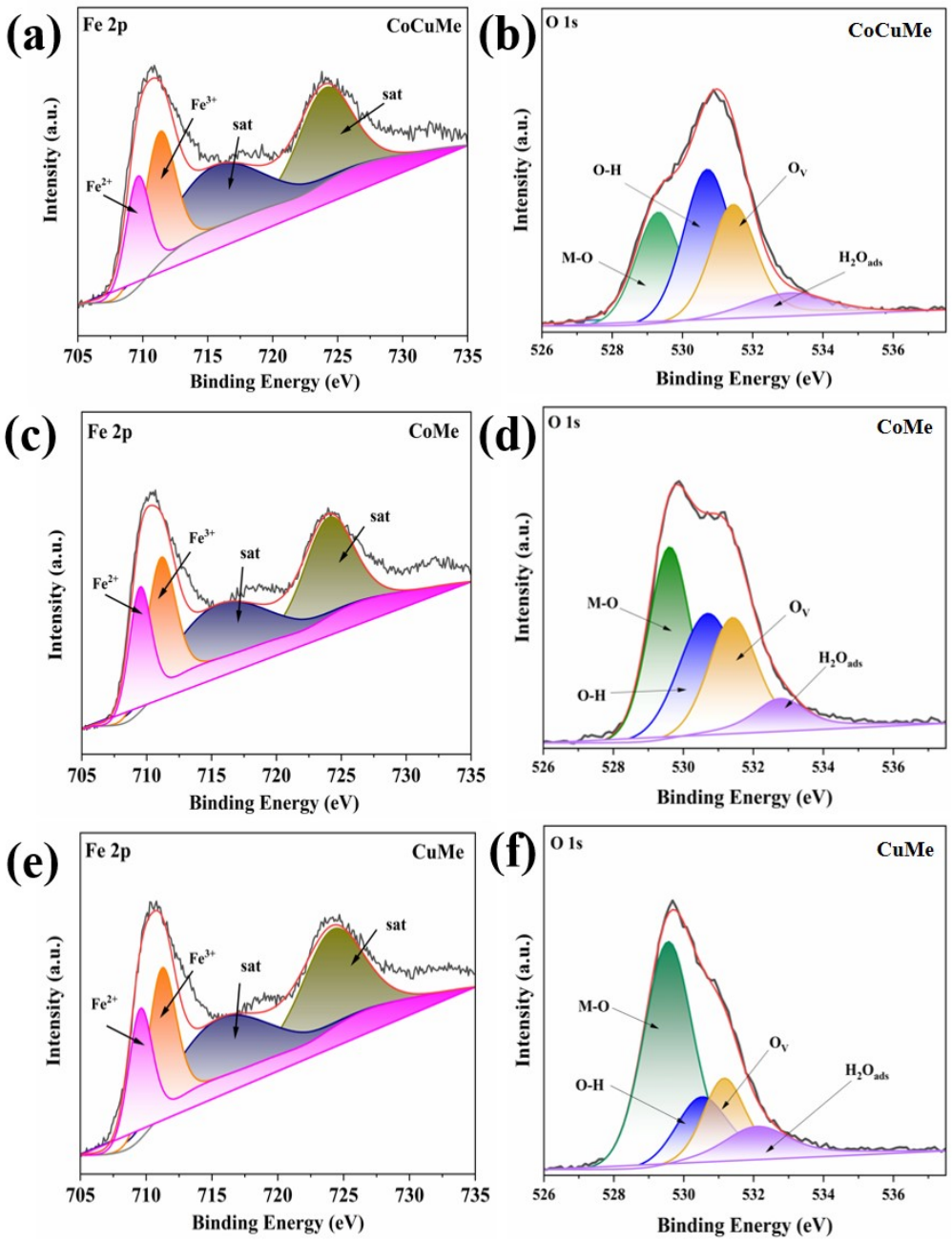

Fig. S4 High-resolution XPS spectra of Fe 2p and O 1s of CoCuMe (a-b), CoMe (c-d) and CuMe (e-f) .

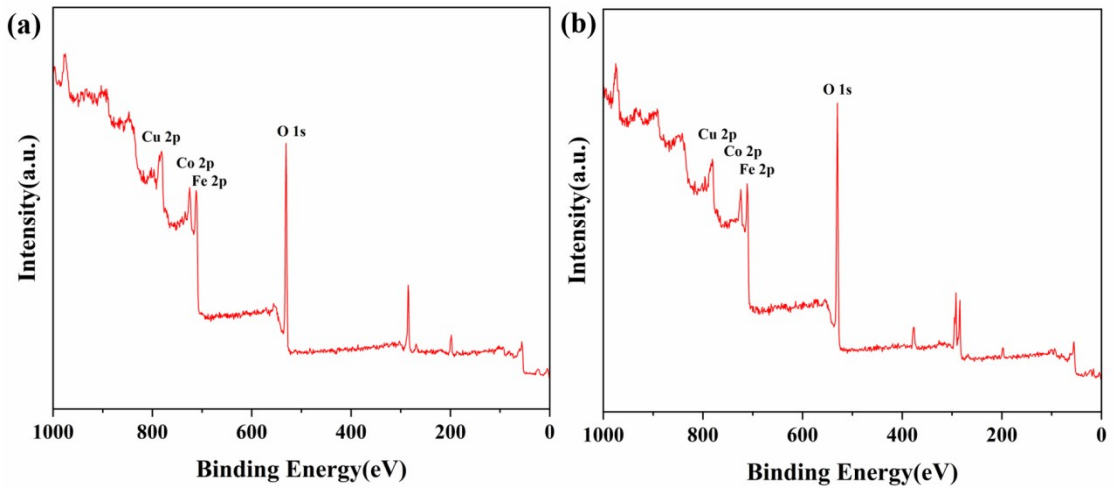

Fig. S5 High-resolution X-ray photoelectron spectroscopy spectra of (a) CoCuMe before 100 mA·cm^{-2} for 100 h and (b) CoCuMe after 100 mA·cm^{-2} for 100 h.

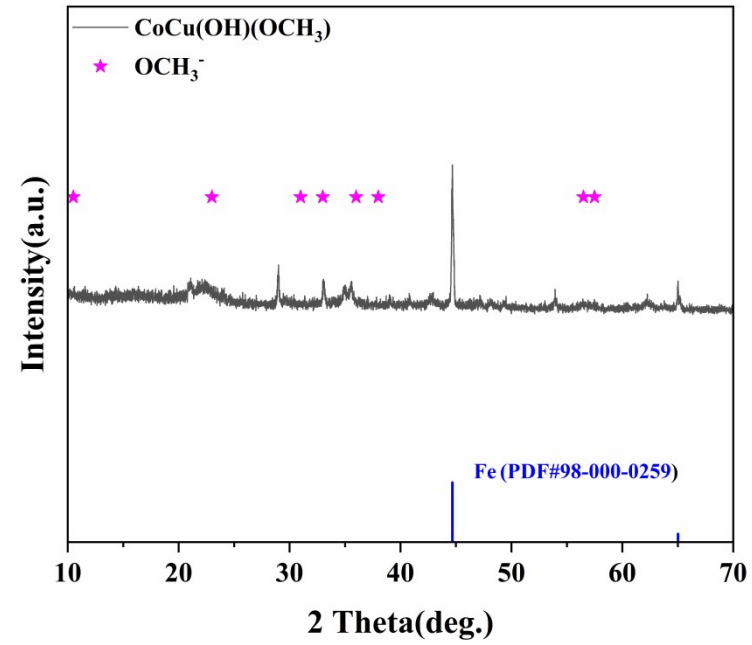

Fig. S6 XRD pattern of CoCuMe after stability test.

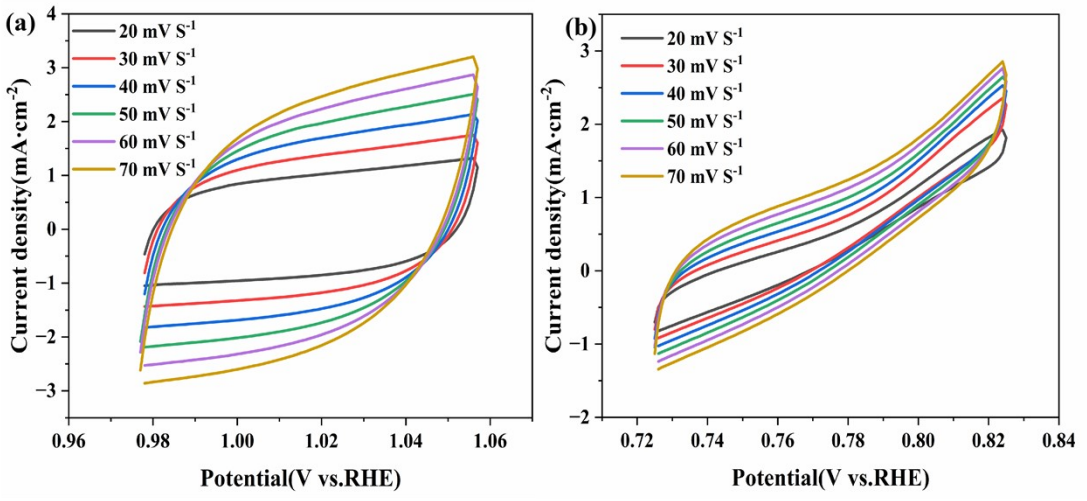

Fig. S7 CV curves for (a) CoMe and (b) CuMe.

Table S2. Nyquist plot fitting results.

Material	CoMe	CuMe	CoCuMe
R_s	0.90 Ω	1.10 Ω	0.87 Ω
R_{ct}	4.69 Ω	16.77 Ω	2.29 Ω

Table S3. Comparison of OER performance of CoCuMe catalysts.

Catalysts	electrolyte	η (mV)	reference
CoCuMe	1 M KOH	281 (η_{20})	**This work**
FeCoNiMnCu	1 M KOH	365 (η_{100})	[1]
a-FeCoNiMgCr-HM	1 M KOH	291 (η_{20})	[2]
$Fe_{0.5}CoNiCuZn_{0.8}$	1 M KOH	340 (η_{10})	[3]
22%Co–Fe_3O_4/IF	1 M KOH	260 (η_{10})	[4]
Co_2Fe_1@NCNT	1 M KOH	270 (η_{10})	[5]
Ru-Mo-O_x/CC	1 M KOH	210 (η_{10})	[6]

Table S4. The binding energies of CoCuMe after 100 mA·cm^{-2} for 100 h .

Fe^{2+}	710.10 eV	Co^{3+} ($2p_{3/2}$)	780.40 eV	Cu^{2+}/Cu^{+}	2.31:1
Fe^{3+}	711.58 eV	Co^{3+}/Co^{2+}	1.59:1	M-O	529.50 eV
Fe^{3+}/Fe^{2+}	1.92:1	Cu^{+} ($2p_{3/2}$)	952.35 eV	O-H	530.77 eV
Co^{2+} ($2p_{1/2}$)	796.95 eV	Cu^{2+} ($2p_{3/2}$)	954.30 eV	O_v	531.70 eV
Co^{2+} ($2p_{3/2}$)	783.81 eV	Cu^{+} ($2p_{1/2}$)	932.40 eV	H_2O_{ads}	532.80 eV
Co^{3+} ($2p_{1/2}$)	795.48 eV	Cu^{2+} ($2p_{1/2}$)	934.80 eV	O_V/M-O	0.6:1

References

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