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Supplementary Information

Recent Advances in Nanoscale Based Electrocatalysts for Metal-Air Battery, Fuel Cell and Water-Splitting Applications: An Overview

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Table S1. Comparison of fuel cell performances on various electrocatalysts.

Synthesis Route	Catalysts	Overpotential/Onset potential (mV)	Current Density (mA cm^{-2})	Medium (M)	Ref.
Sol-gel	Pt/Clay/Nafion	910	4.2	05 H_2SO_4	[1]
Solvothermal	PVA/SGO/Fe_3O_4	670	25.57	1M NaCl	[2]
Hummer's	Fe/Ni-MOFs/NG-20	109	8.56	0.1 KOH	[3]
Calcinations	Hematite-LCP electrolyte	940	-	$LaCePrO_x$ (LCP)	[4]
CVD	Pt/GC-240 Pt/GC-500	940 940	661 653	Polyelectrolyte	[5]
Hydrothermal	Pt/TiO_2/rGO	750	45.8	05 H_2SO_4	[6]
Hummer's	Pt-MnO_2-ERGO	360	1.76	01 H_2SO_4	[7]
Hummer's	XC-72/Carbon/Pd	550	7.3	05 H_2SO_4	[8]
Electrodeposition	Co_3O_4-3DrGO/Nif	442	0.012	0.1 KOH	[9]
Solution casting	SPEEK/PABS-SWCNT	660	80	05 H_2SO_4	[10]

Table S2. Summary of ORR and OER electrocatalytic activities of the reported various types of advanced nanoscale based catalysts.

Synthesis Route	Catalysts	Morphology	Specific Capacity (mAh g^{-1})	Current Density (mA cm^{-2})	Medium (M)	Ref.
Electrospinning	Fe_3C@N-CFs	Nanofiber	1287.3	10	0.1 KOH	[11]
Coating	Co^{II}-salen/MWCNT@MnO_2	Nanosheet	1000	0.15	-	[12]
Electrodeposition	Co_3O_4@Co/NCNT	Core-shell	891	135	0.5 H2SO4	[13]
Hydrothermal	Zn-Co-SNN/CFP	Nanoplate	484.7	10	0.1 KOH	[14]
Hydrothermal	NP Co_3O_4/Fe@C_2N	Nanoparticles	790.1	165.8	0.1 KOH	[15]
Hydrothermal	800N,P-CNT	Porous structure	762	20	0.1 KOH	[16]
Solid-state	PANI@ZnPC	Pores structure	713	-	7 KOH	[17]
Dissolution	PVA-5wt.%SiO_2GPE	Porous structure	720.6	0.3	0.1 KOH	[18]
Hydrothermal	8-MnO_2/N-rGO	Wrinkled structure	5250	0.2	0.1 KOH	[19]
Solution combustion	Co/$CoFe_2O_4$	Porous structure	4320	100	0.1 KOH	[20]

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