Supporting Information (SI):

Ampere-level oxygen evolution reaction driven by Co_3O_4 nanoparticles supported on the layered TiO_2

Hong Tang[a], Wei Wu[a], Takahiro Kojima[a], Kenji Kazumi[b], Kazuhiro Fukami[b] and Hiroshi Sakaguchi[*a]

a Institute of Advanced Energy, Kyoto University, Kyoto 611-0011, Japan

b Department of Materials Science and Engineering, Kyoto University, Kyoto 606-8501, Japan

* Corresponding author

E-mail: sakaguchi@iae.kyoto-u.ac.jp

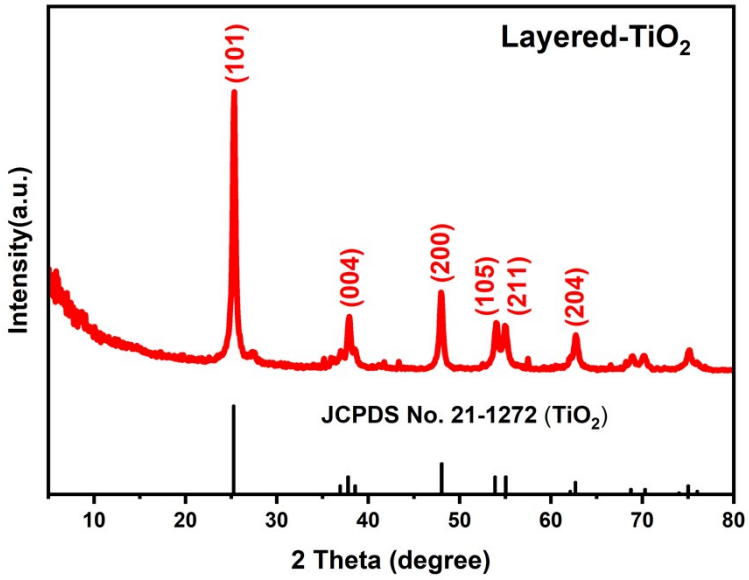

Fig. S1 XPD pattern of layered-TiO_2.

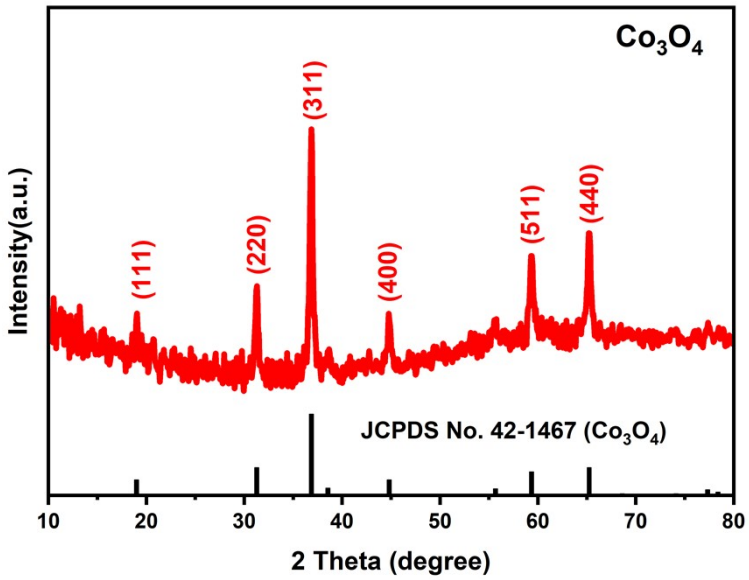

Fig. S2 XPD pattern of Co_3O_4.

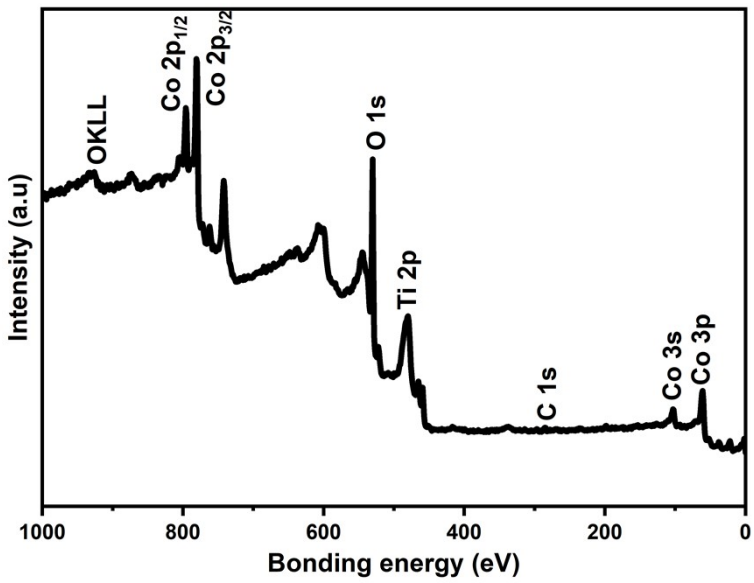

Fig. S3 XPS survey spectrum of Co_3O_4@layered-TiO_2.

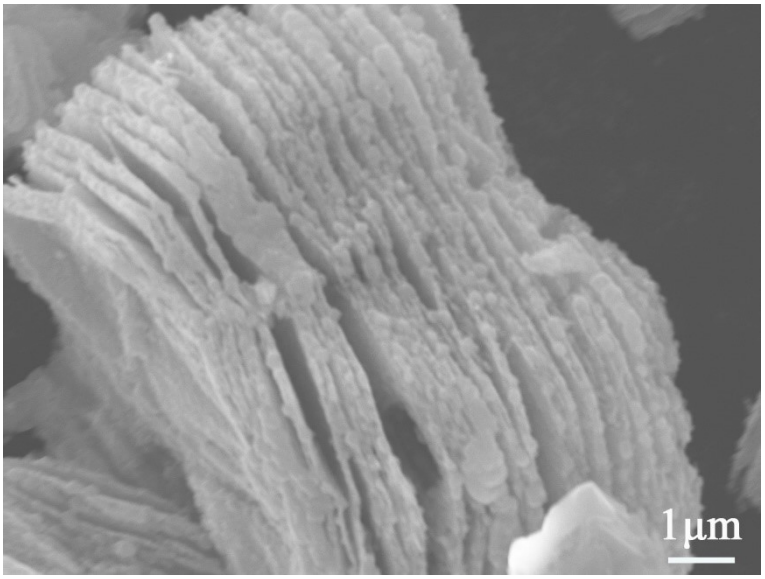

Fig. S4 SEM image of layered-TiO_2.

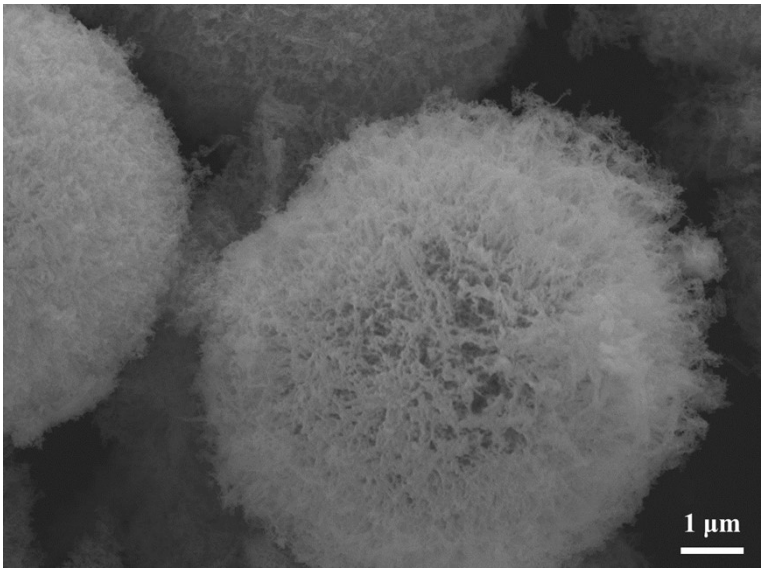

Fig. S5 SEM image of Co_3O_4.

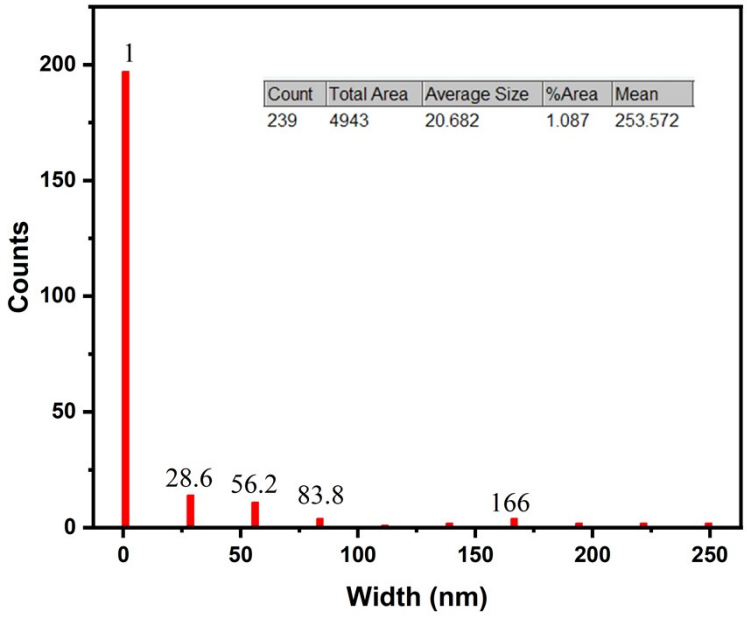

Fig. S6 Statistical analysis of particle size distribution of Co_3O_4 nanoparticles on TiO_2 substrate.

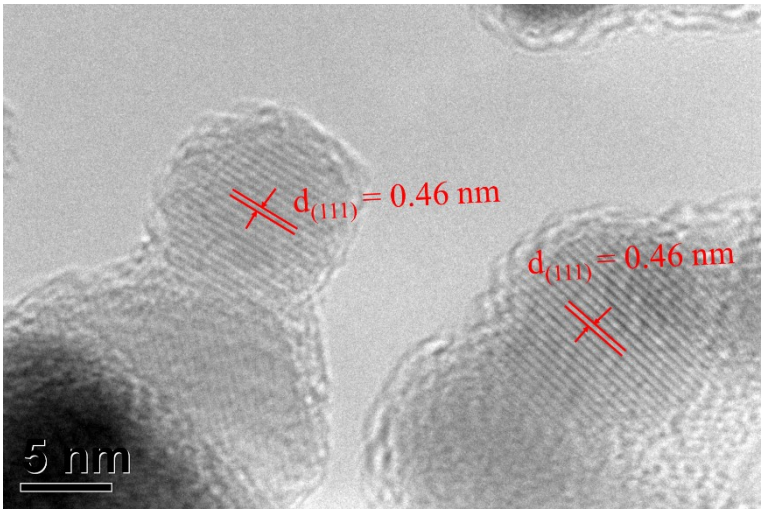

Fig. S7 HR-TEM image of Co_3O_4@layered-TiO_2.

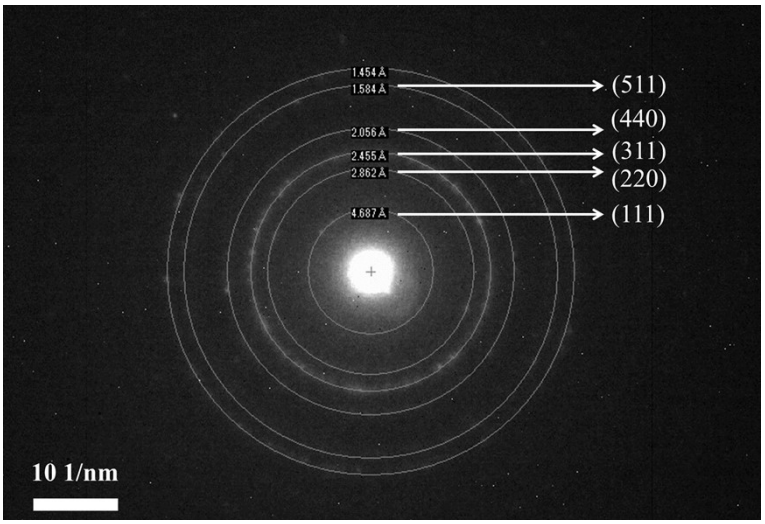

Fig. S8 SEAD image of Co_3O_4 in Co_3O_4@layered-TiO_2.

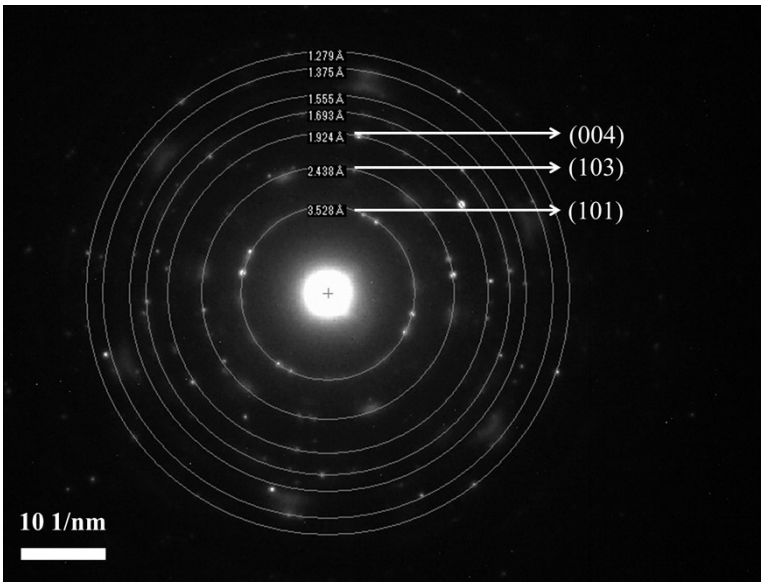

Fig. S9 SEAD image of TiO_2 in Co_3O_4@layered-TiO_2.

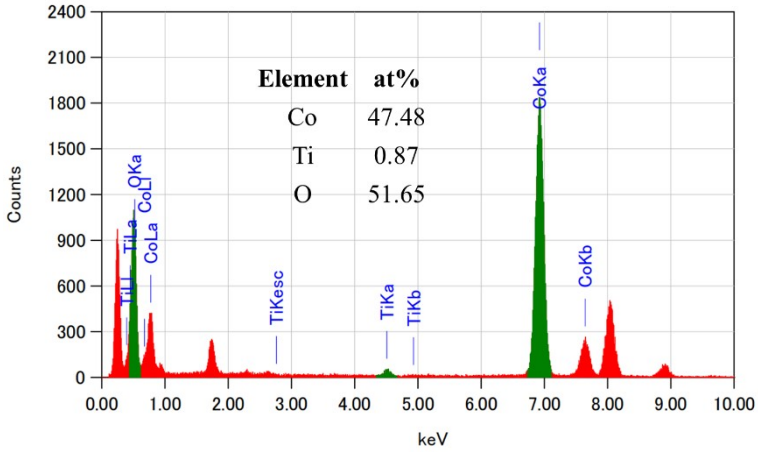

Fig. S10 EDX image of Co_3O_4@layered-TiO_2.

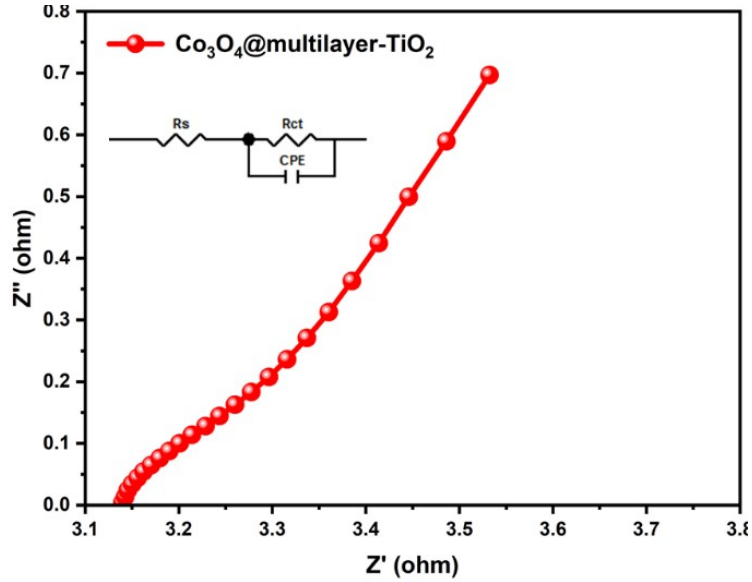

Fig. S11 EIS spectrum of Co_3O_4@layered-TiO_2. Insert shows equivalent circuit.

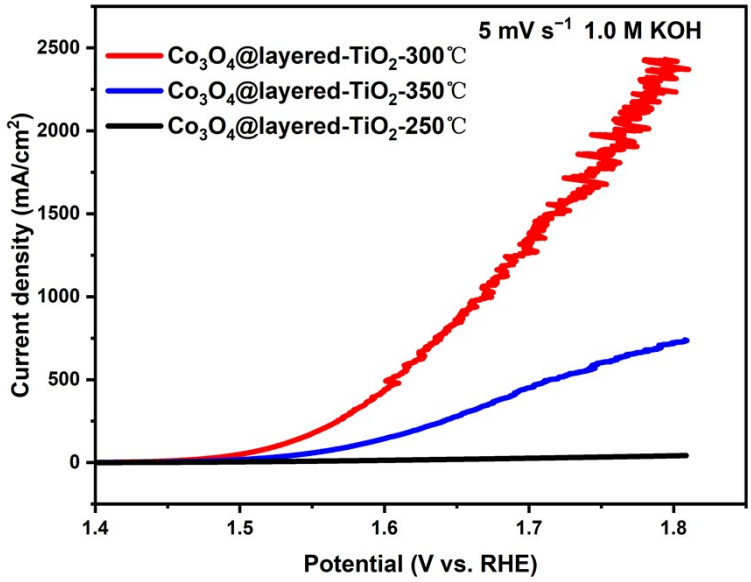

Fig. S12 LSV curves of Co_3O_4@layered-TiO_2 under different annealing temperatures (250, 300 and 350 ℃).

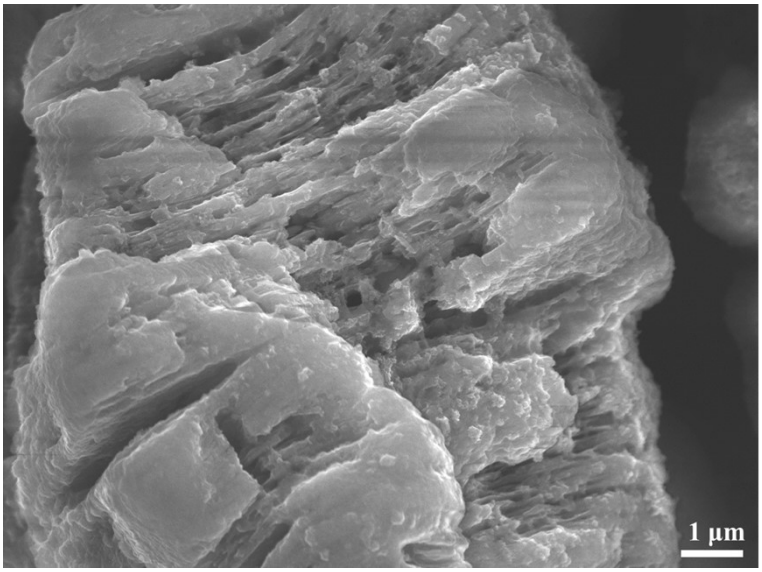

Fig. S13 SEM image of Co_3O_4@layered-TiO_2 after galvanostatic measurement.

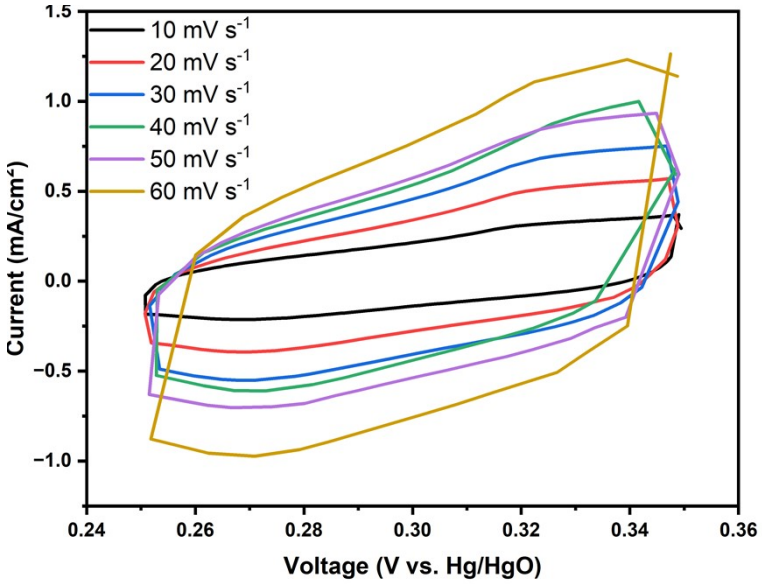

Fig. S14 CV curves of Co_3O_4@layered-TiO_2 in 1.0 M KOH.

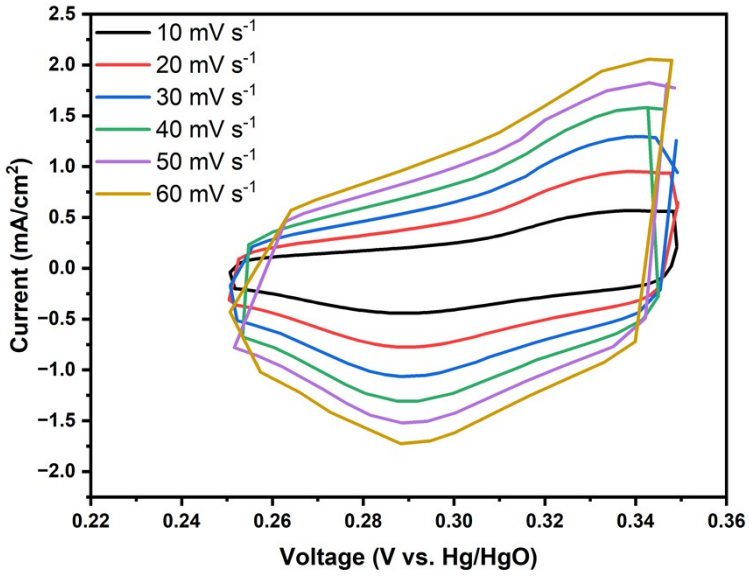

Fig. S15 CV curves of RuO_2 in 1.0 M KOH.

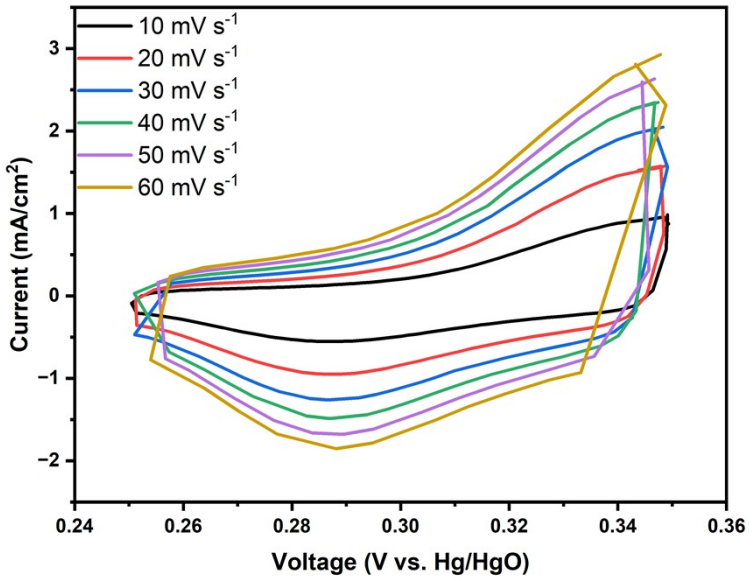

Fig. S16 CV curves of Co_3O_4 in 1.0 M KOH.

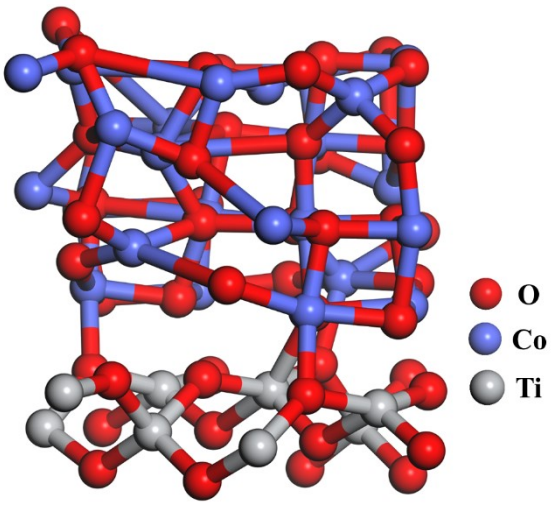

Fig. S17 Optimized structural model of TiO_2-Co_3O_4.

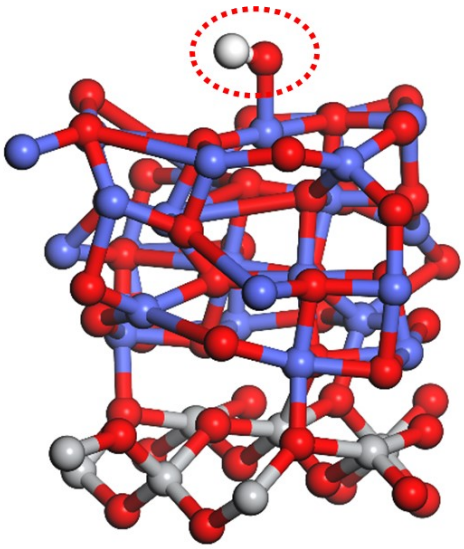

Fig. S18 Optimized the structural model after adsorbing OH on the Co site of TiO_2-Co_3O_4.

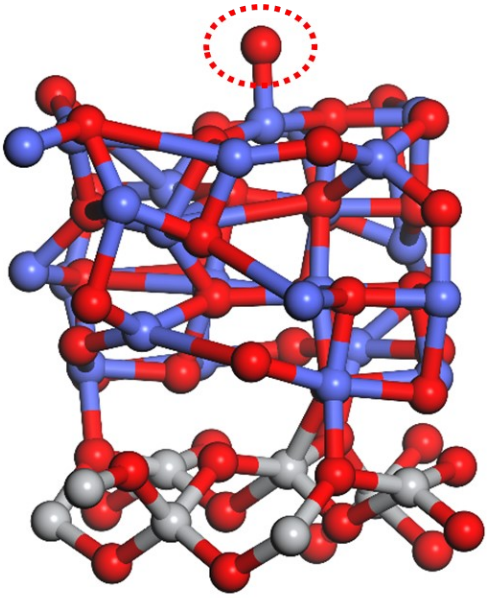

Fig. S19 Optimized the structural model after adsorbing O on the Co site of TiO_2-Co_3O_4.

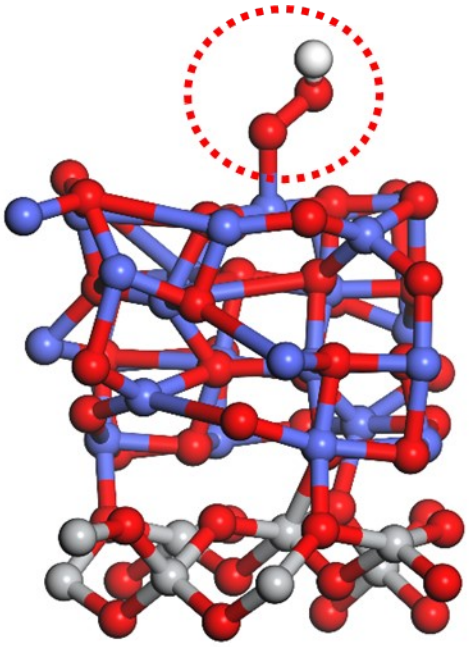

Fig. S20 Optimized the structural model after adsorbing OOH on the Co site of TiO_2-Co_3O_4.

Table S1. Previously reported literature of splendid Co_3O_4-based oxygen evolution catalysts.

Reference		Catalyst
1	our work	TiO_2-Co_3O_4
2	*J. Alloys Compd.* 2021, 853, 156946	Co_3O_4-MoS_2 thin films
3	*Adv. Energy Sustainability Res.* 2023, 4, 2300123	Co_3O_4/CeO_2 heterojunction nanonetworks
4	*ACS Appl. Energy Mater.* 2020, 3, 5439−5447	n-Co_3O_4
5	*Carbon Energy* 2023, 5, 279	Mo-Co_3O_4@CC
6	*ACS Catal.* 2022, 12, 13482−13491	$Ir_{0.33}$@Co_3O4
7	*Angew. Chem. Int. Ed.* 2020, 59, 6929 – 6935	CoO/Co_3O_4
8	*Adv. Mater.* 2018, 30, 1801211	Co_3O_4/Co-Fe oxide
9	*Adv. Energy Mater.* 2021, 11, 2101324	$NiMoO_4$@Co_3O_4
10	*ACS Catal.* 2018, 8, 2236−2241	$P_{8.6}$-Co_3O_4/NF
11	*ACS Catal.* 2023, 13, 2462−2471	Ru/Co_3O_{4-x}
12	*Adv. Mater.* 2020, 32, 2002235	Fe-Co_3O_4
13	*Adv. Energy Mater.* 2018, 8, 1701694	O-Co_3O_4
14	*Adv. Energy Mater.* 2023, 13, 2302537	Ir/Ni-Co_3O_4