Electronic Supplementary Material (ESI) for New Journal of Chemistry.

The role of synthesis vis-à-vis oxygen vacancies of Co_3O_4 in oxygen evolution reaction

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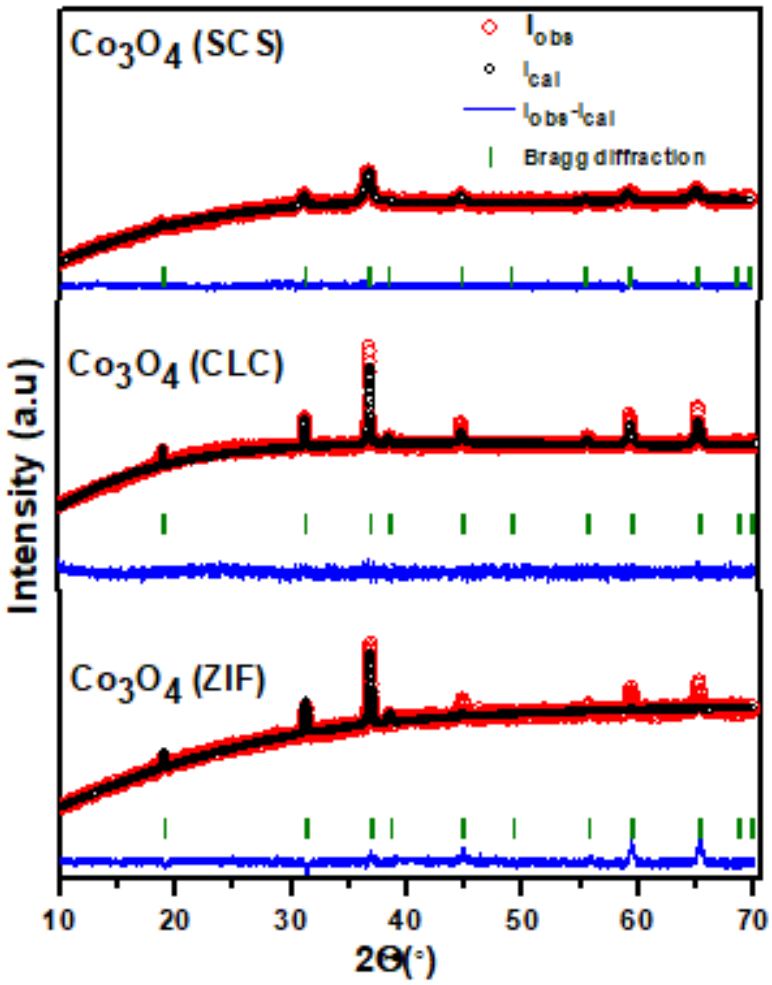

Fig. S1 Rietveld refinement of the three Co-oxides

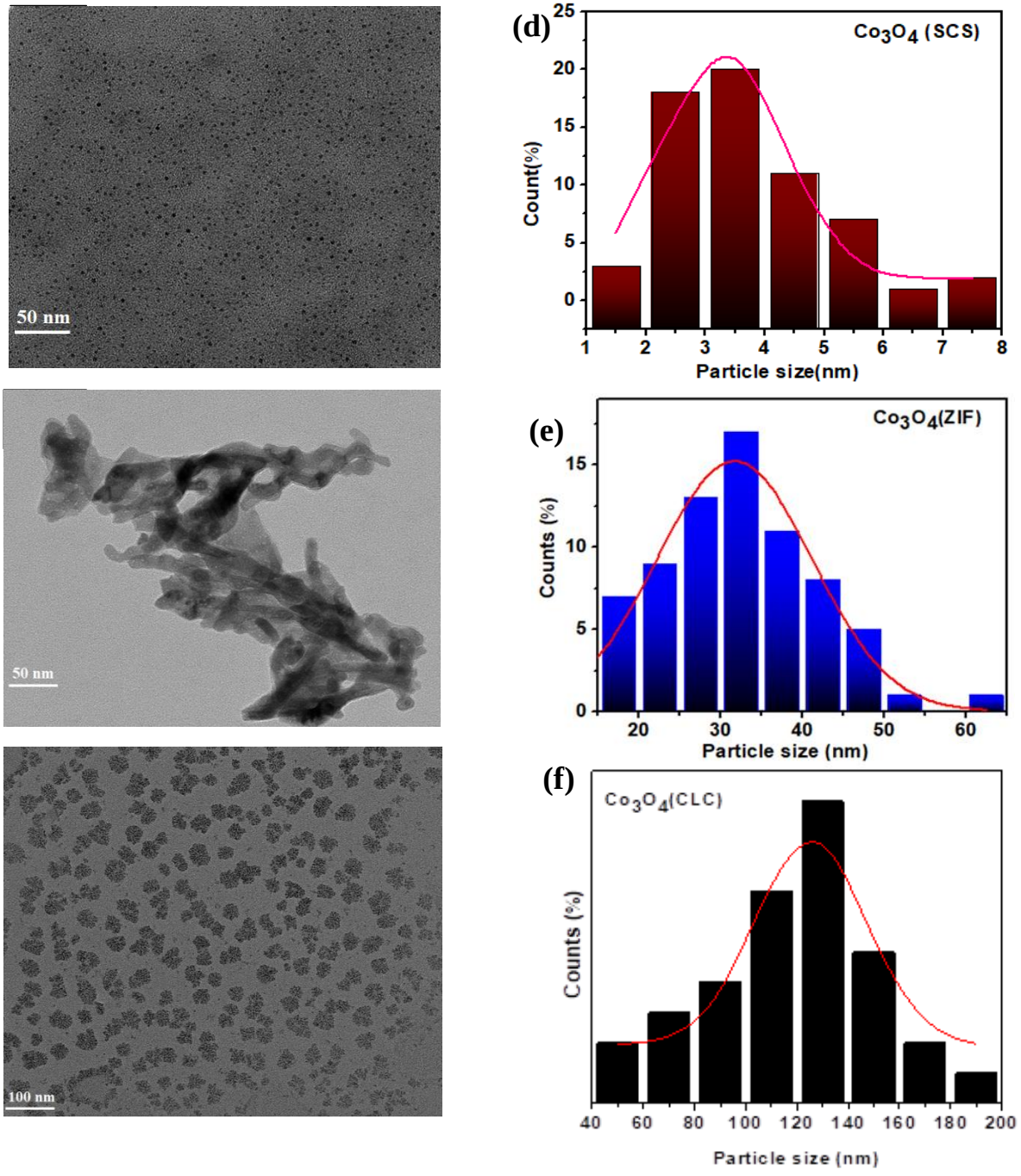

Fig. S2 HR-TEM image of Co_3O_4 (SCS) (a), Co_3O_4 (ZIF) (b), Co_3O_4 (CLC) (c), corresponding particle size distribution plot of Co_3O_4 (SCS) (d), Co_3O_4 (ZIF) (e), Co_3O_4 (CLC) (f).

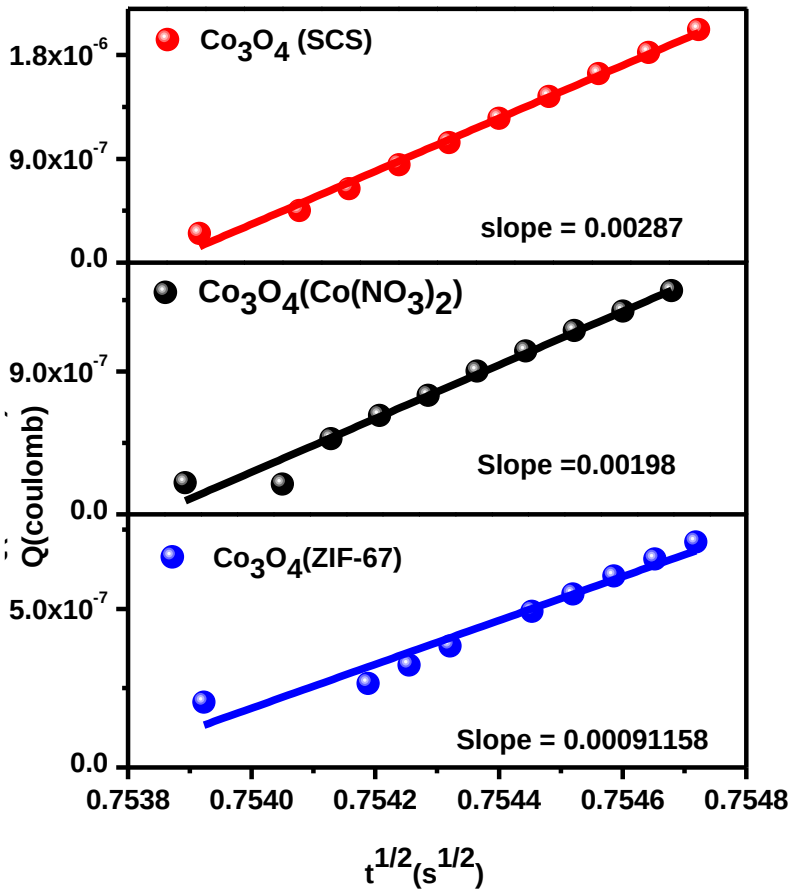

Fig. S3 The electrochemical active surface area (ECSA) of the three of the three Co-oxide.

Calculation of electrochemical active surface areas (ECSA):

The ECSA was measured using chronoamperometry fast study which was carried out in the presence of 0.01 M potassium ferricyanide and 0.1 M KCl as an electrolyte. Finally, the ESCA was calculated using the Cottrell equation:

$Q = 2nFAD^{1/2}\, C_0\, t^{\frac{1}{2}}\, \pi^{-1/2}$

Where Q = Charge in coulombs

n = Number of electrons being transferred

F = Faraday constant (96,485 C/mol)

A = ECSA (cm^2)

D = Diffusion coefficient for $K_3[Fe(CN)_6]$ (7.6×10^{-6} cm^2 /s)

C_0 = Concentration of $K_3[Fe(CN)_6]$ (mol/cm^3)

t = time (s)

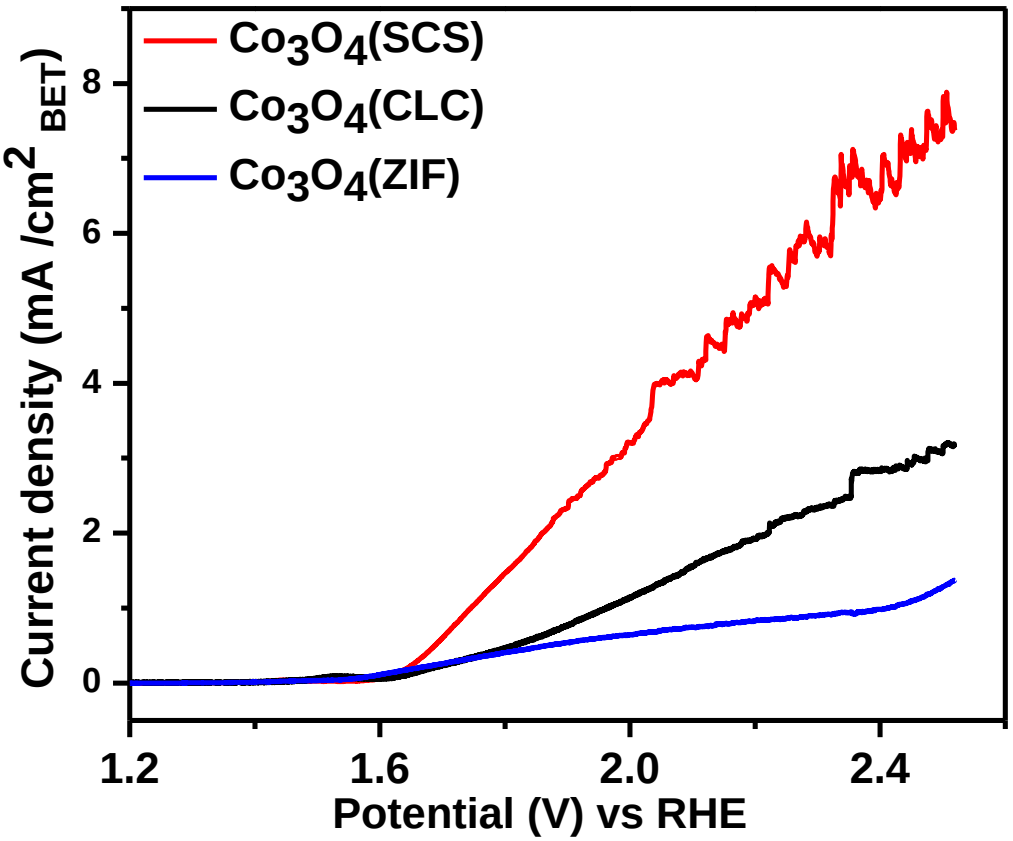

Fig. S4 LSV plot of the three Co-oxides normalized with BET surface area.