Electronic Supplementary Material (ESI) for RSC Advances.

Ultrafine Co_3O_4 nanolayer shelled CoWP nanowire array: a bifunctional electrocatalyst for overall water splitting

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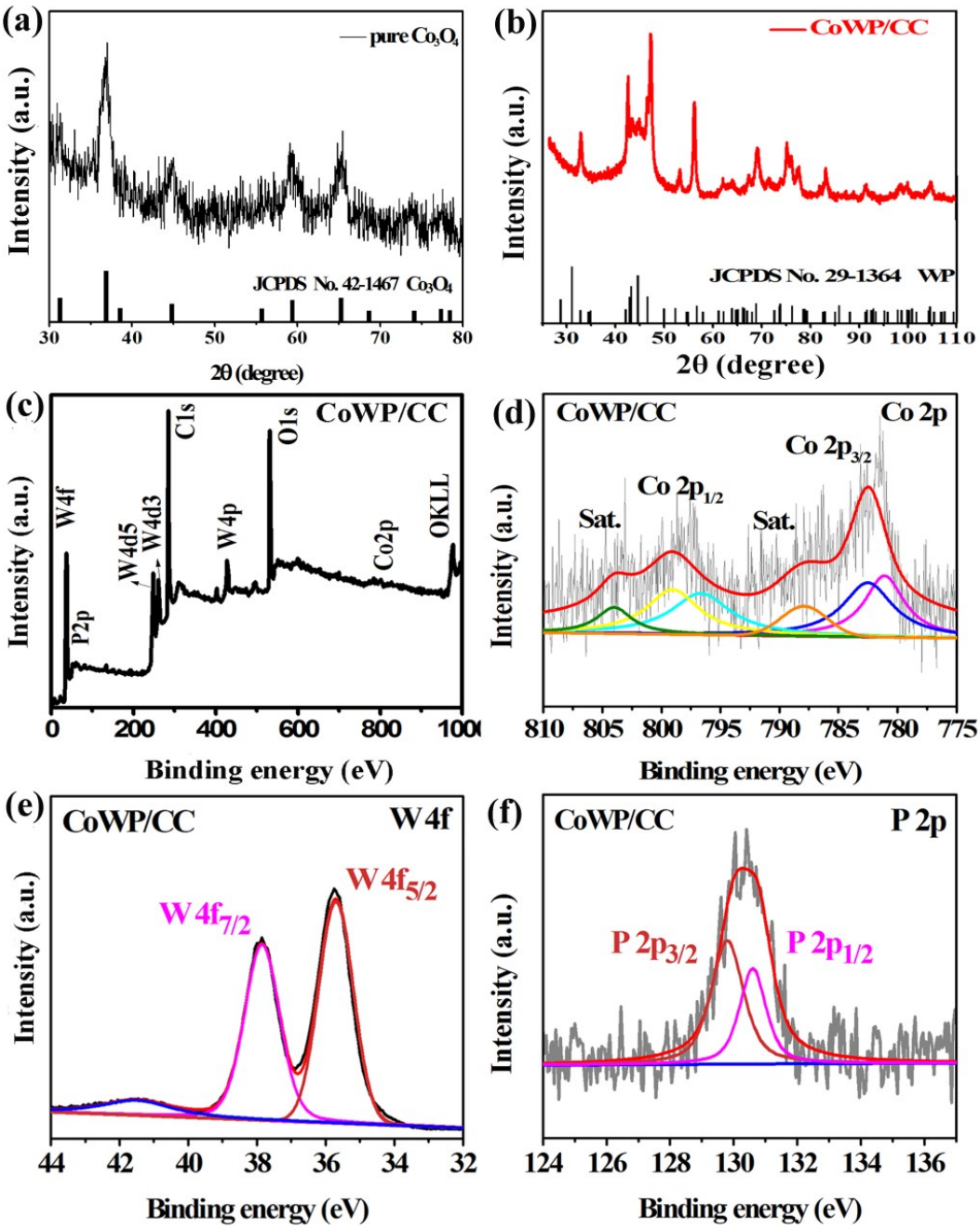

Fig. S1. XRD patterns of the (a) Co_3O_4, (b) CoWP/CC. (c) XPS survey spectrum of the CoWP/CC and the core level spectra of (d) Co 2p, (e) W 4f, (f) P 2p, respectively.

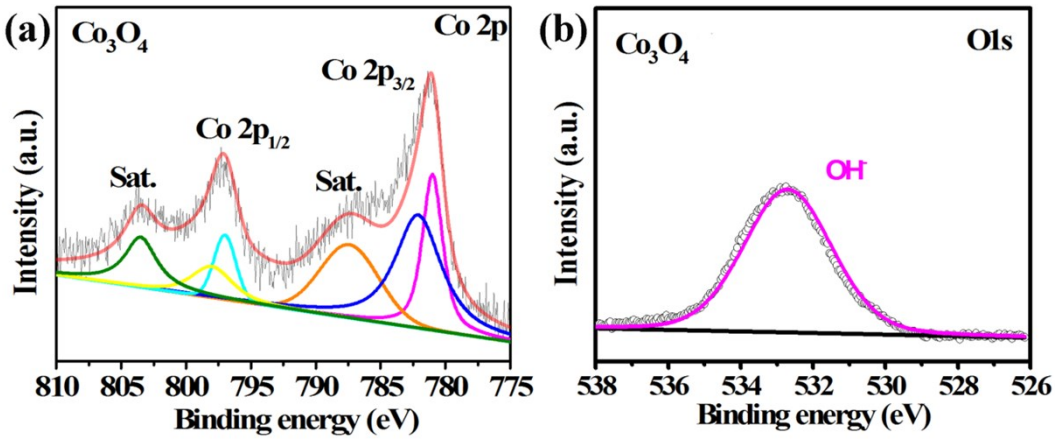

Fig.S2. XPS core level spectra of Co_3O_4 (a) Co 2p, (b) O 1s.

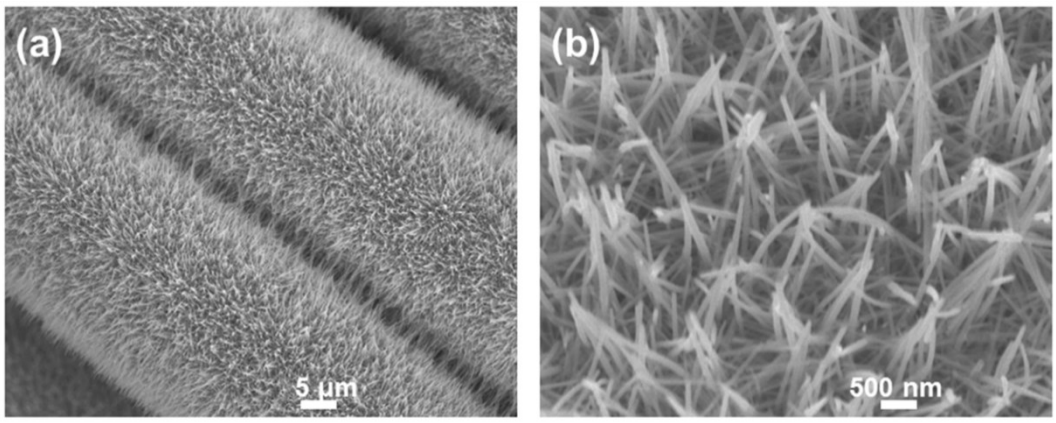

Fig. S3. SEM images of CoWO/CC (a) the whole morphology, (b) enlarged image.

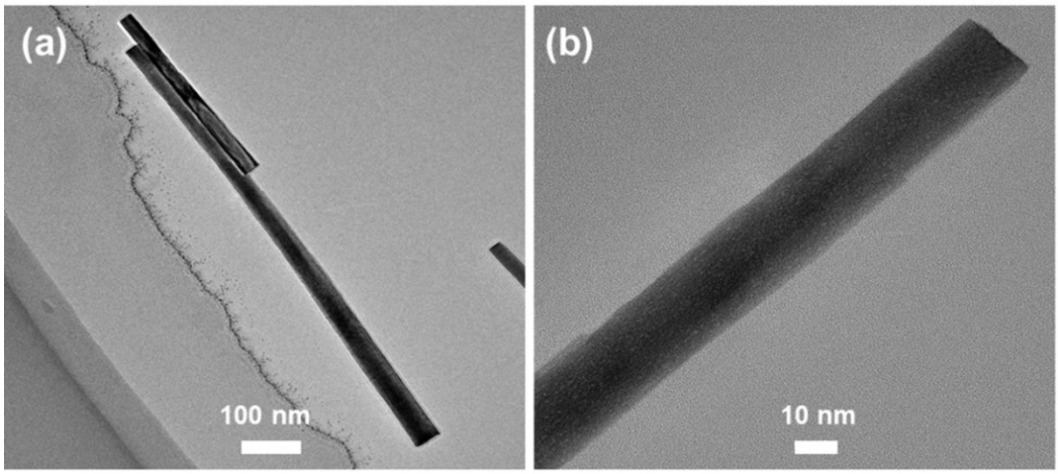

Fig. S4.TEM images of Co-WP/CC in (a) low magnification (b) high magnification.

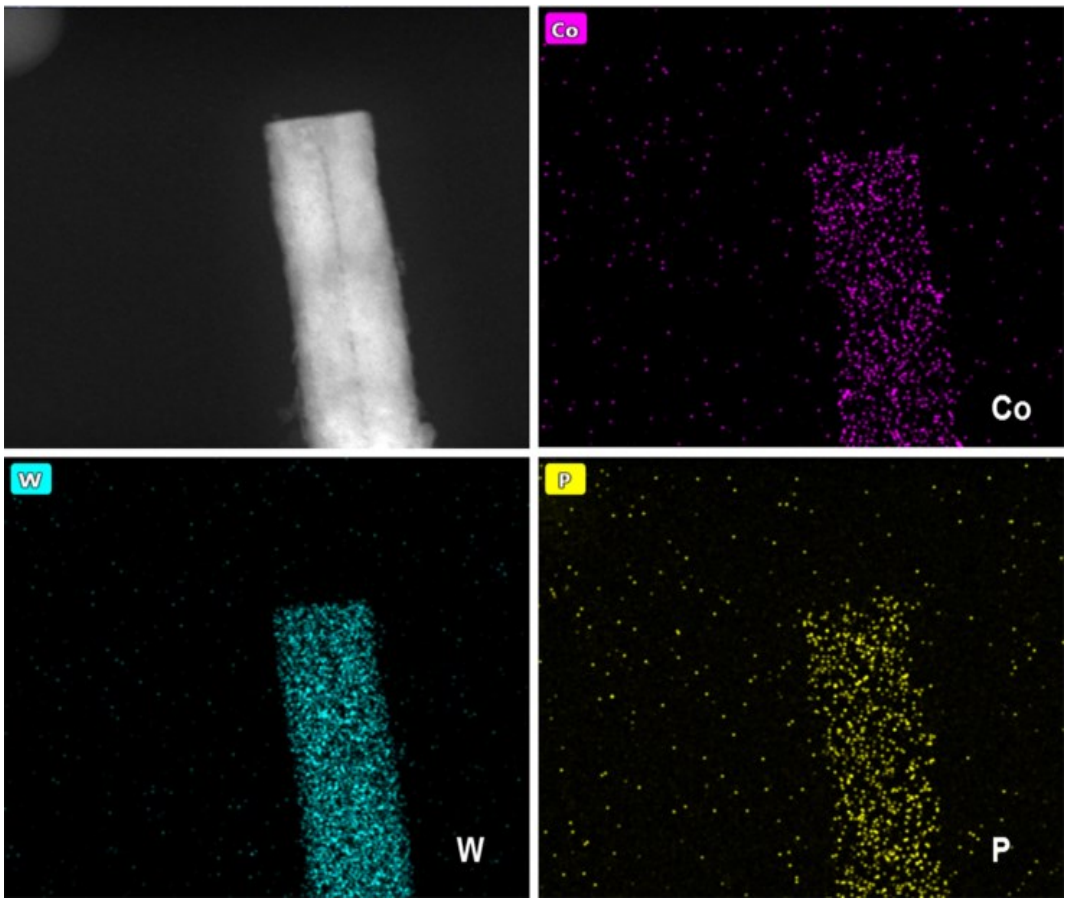

Fig. S5. HAADF-STEM image and its corresponding element mapping images of the CoWP/CC.

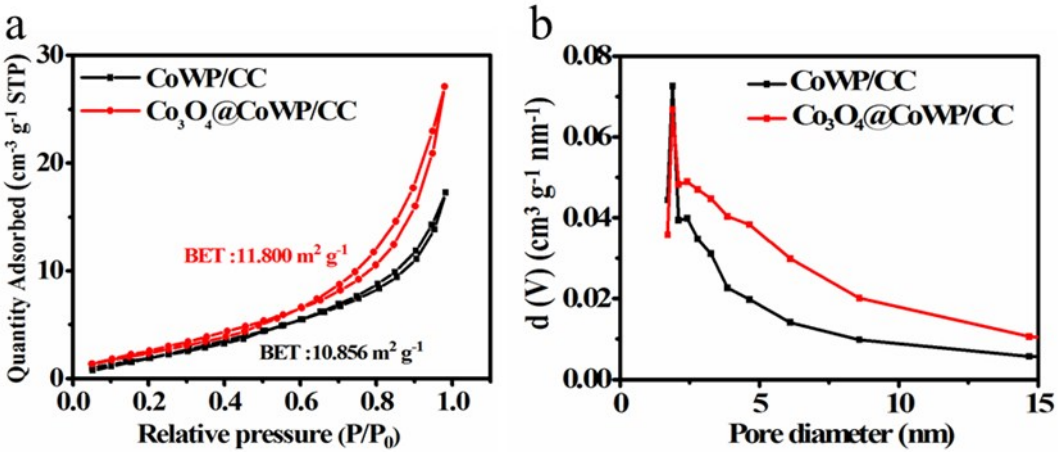

Fig.S6. (a)N_2 adsorption/desorption isotherms of CoWP/CC and Co_3O_4@CoWP/CC.

(b) the pore size distributions of CoWP/CC and Co_3O_4@CoWP/CC.

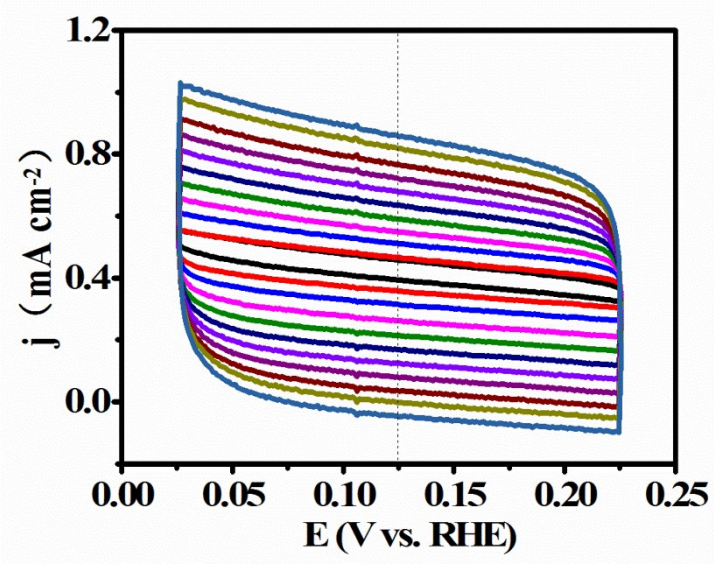

Fig. S7. CV curves at different scan rates for Co_3O_4@CoWP/CC (10-200 mV s^{-1}).

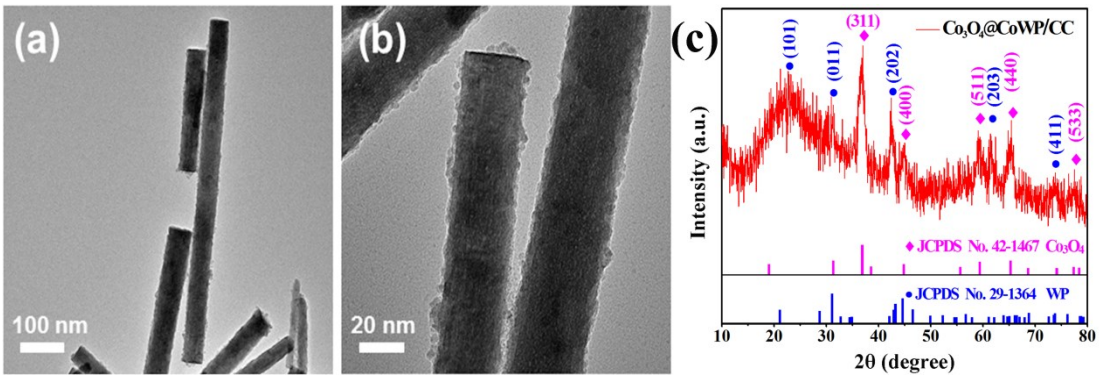

Fig. S8. (a, b) TEM and (c) XRD pattern of Co_3O_4@CoWP/CC after 24 h continuous electrolyzing at 10 mA cm^{-2} for HER.

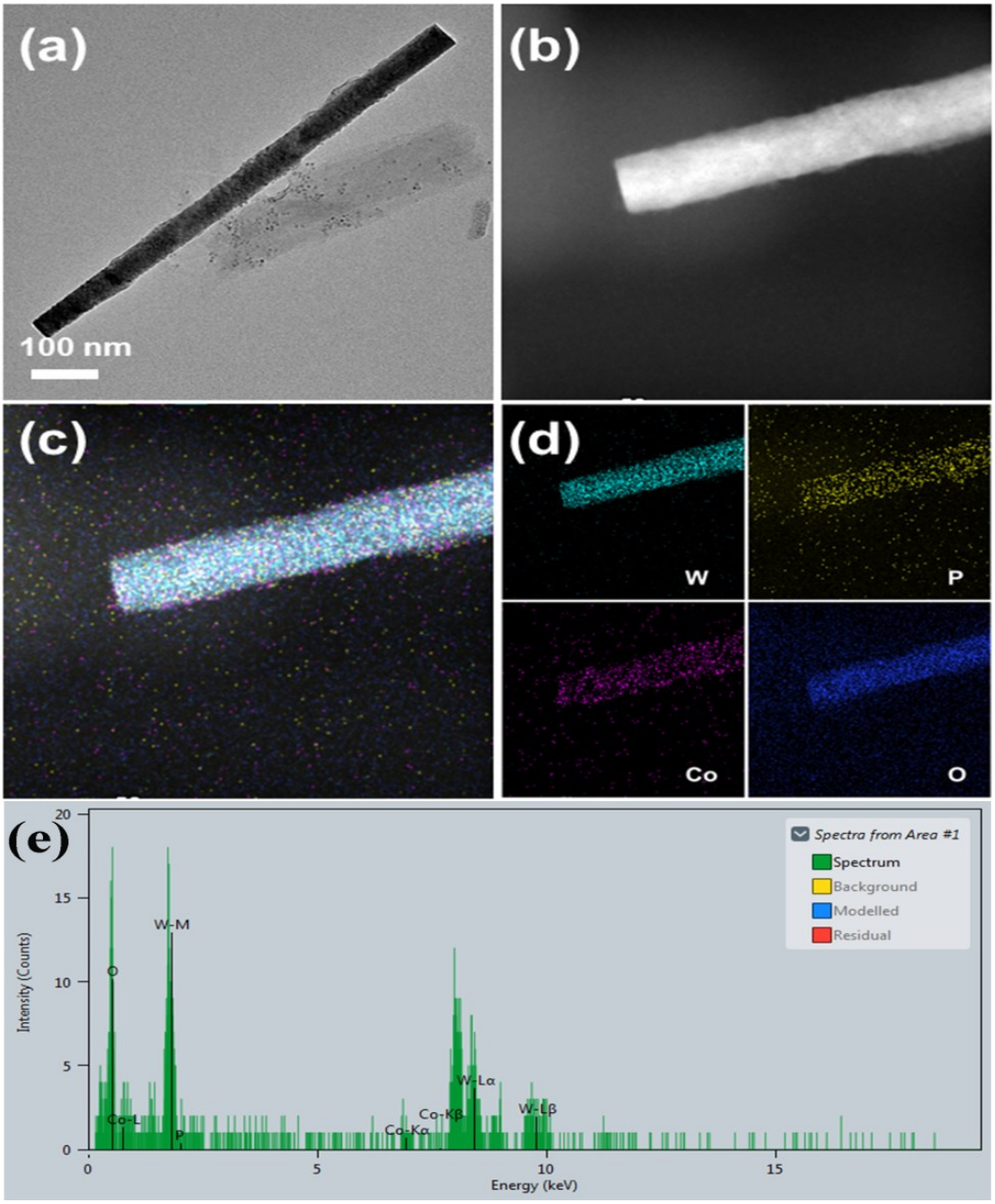

Fig. S9. (a) TEM image, (b-d) HAADF-STEM images with the element mapping images, and (e) EDS spectrum of the Co_3O_4@CoWP/CC after 24 h continuous electrolyzing at 10 mA cm^{-2}.