

Supporting information

Precious Metal-Free CoP Nanorod Electrocatalyst as an Effective Bifunctional Oxygen Electrode for Anion Exchange Membrane-Unitized Regenerative Fuel Cells

Palanisamy Rajkumar^{a†}, Md. Masud Rana^a, Beom-Soo Kang^a, Ho-Jung Sun^b, Gyungse Park^c, So Yeon Kim^d, Hong-Ki Lee^c, Joongpyo Shim^{a,*}

^aDepartment of Chemical Engineering, Kunsan National University, Jeonbuk 54150, South Korea

^bDepartment of Material Science and Engineering, Kunsan National University, Jeonbuk 54150, South Korea

^cDepartment of Chemistry, Kunsan National University, Jeonbuk 54150, South Korea

^dDepartment of Chemical Engineering Education & Graduate School of Energy Science and Technology, Chungnam National University, Daejeon 34134, South Korea

^eFuel Cell Regional Innovation Center, Woosuk University, Jeonbuk 55315, South Korea

*Corresponding author: jpshim@kunsan.ac.kr

[†]Current address: Department of Mechanical Engineering, Yeungnam University, Gyeongsan-si 214-1, Gyeongbuk 712-749, South Korea

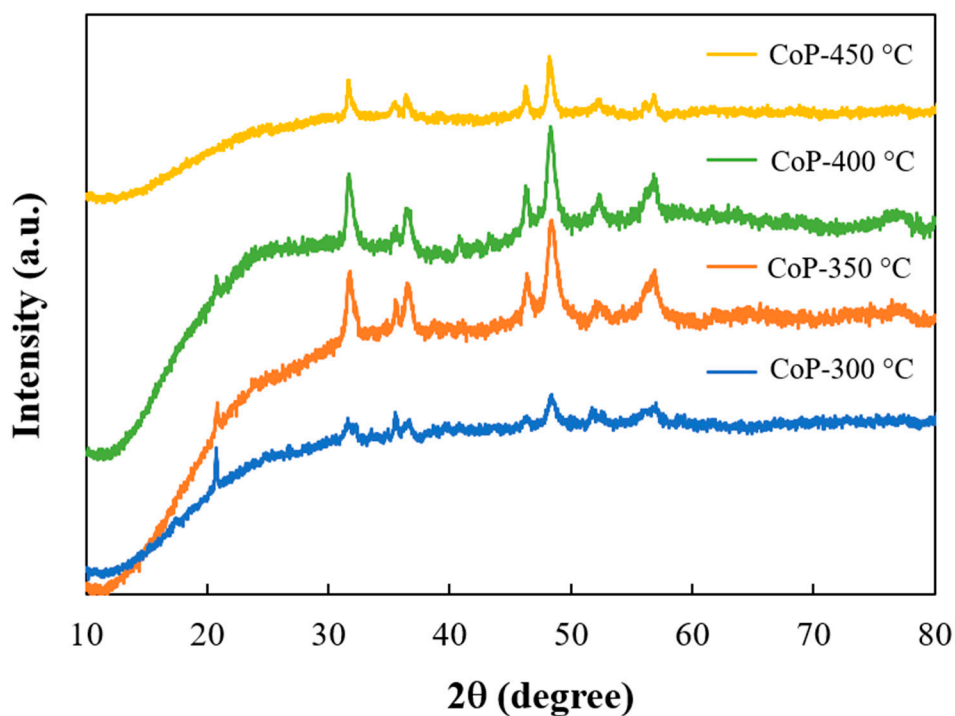


Figure S1. XRD patterns of CoP at different temperatures

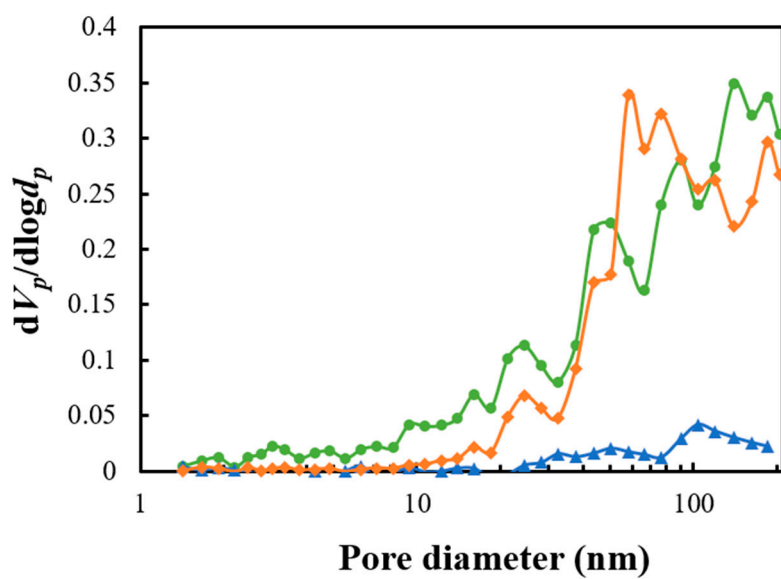


Figure S2. Pore size distribution curves of Co(OH)F, CoP and Co₃O₄

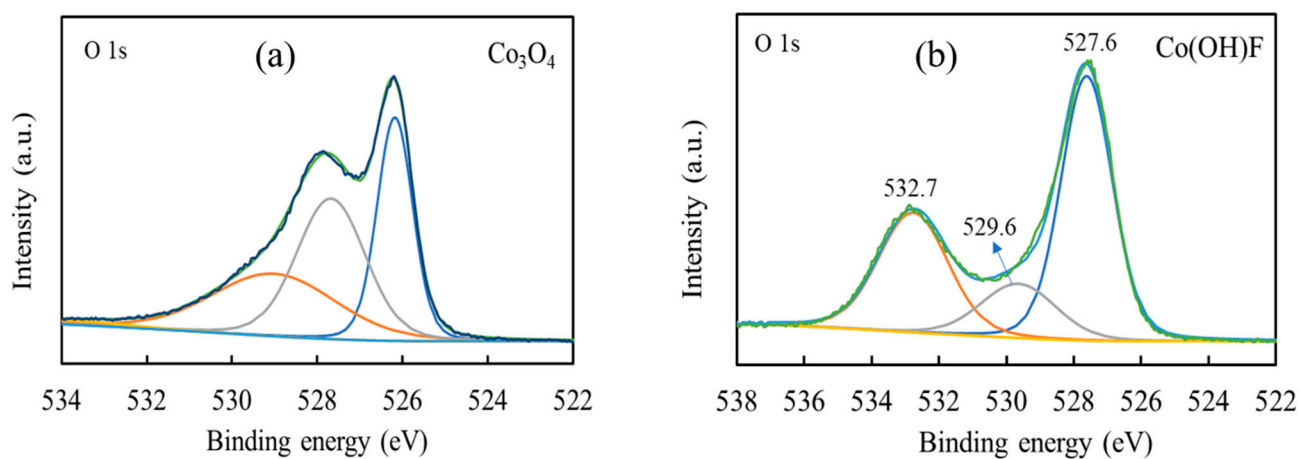


Figure S3. Deconvoluted O1s spectra of (a) Co₃O₄ and (b) Co(OH)F samples

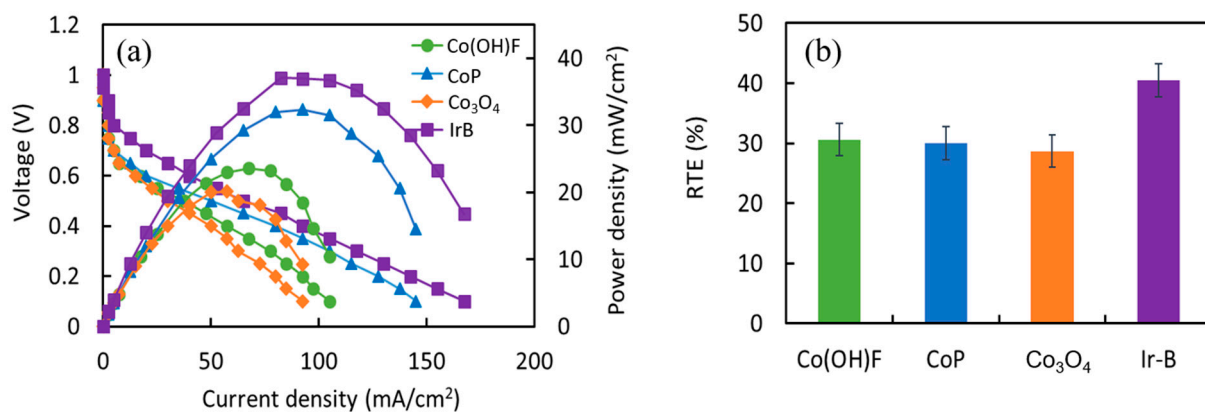


Figure S4. (a) Power density and (b) RTE of Co(OH)F, CoP and Co₃O₄ for fuel cell performance

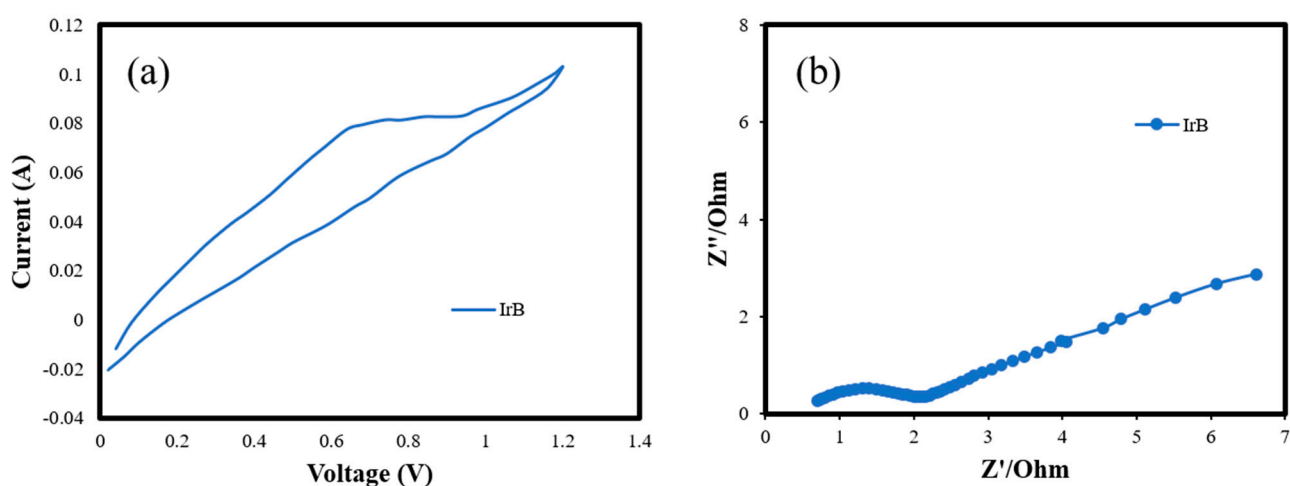


Figure S5. After fuel cell mode (a) CV and (b) EIS of IrB sample as Oxygen electrode and Pt/C as hydrogen electrode

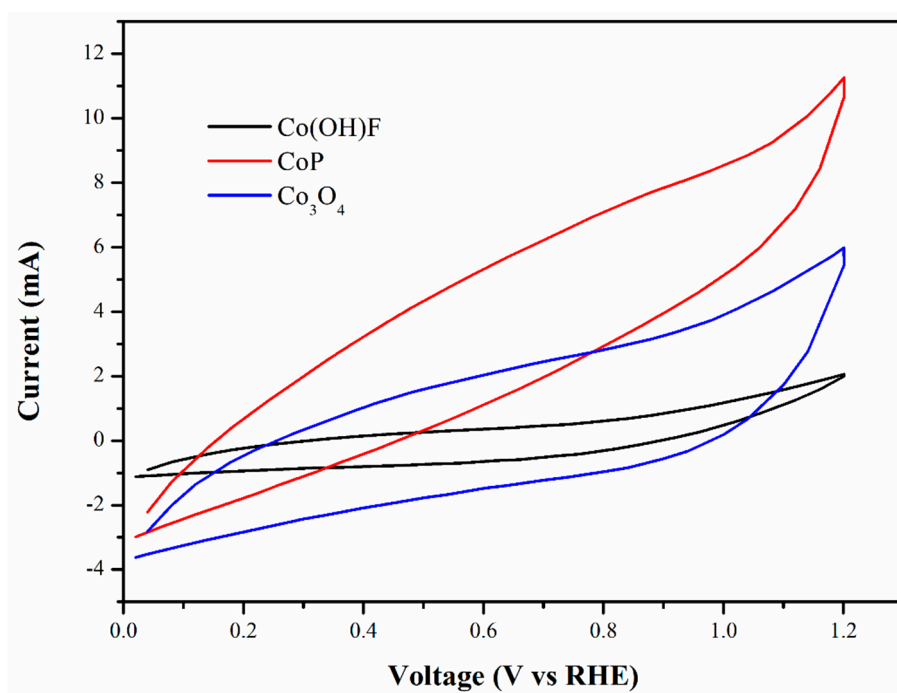


Figure S6. 50th cycle CV curves of Co(OH)F, CoP and Co₃O₄ catalysts

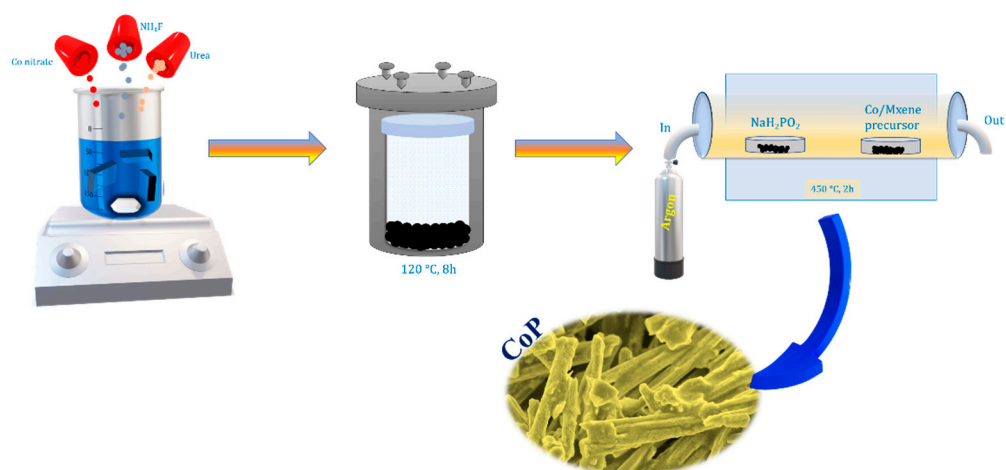
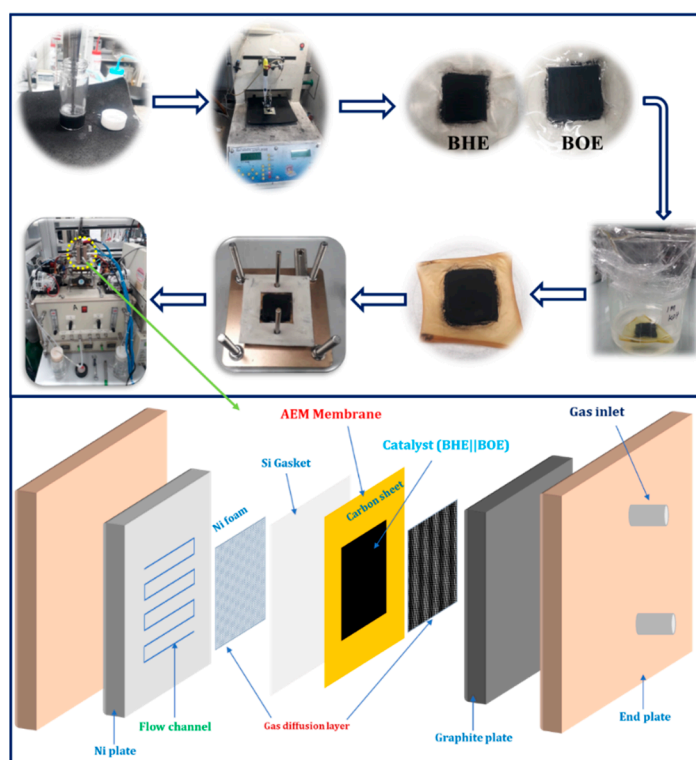


Figure S7. Schematic diagram of the preparation procedure



Scheme S1. Schematic illustration of MEA preparation and cell assembly