

Figure S1.

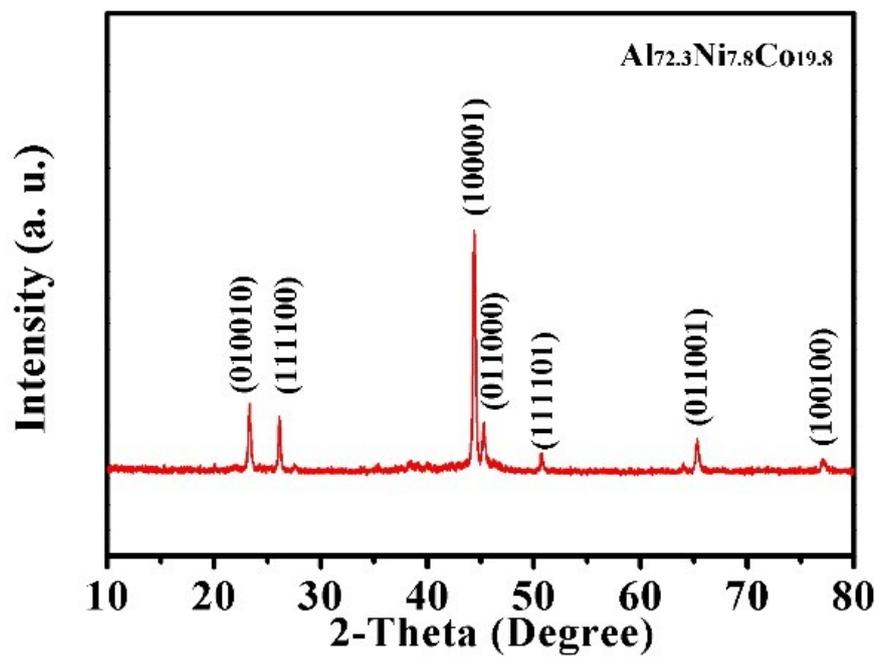


Figure S1. XRD pattern of  $\text{Al}_{72.3}\text{Ni}_{7.8}\text{Co}_{19.8}$  QC alloy.

Figure S2.

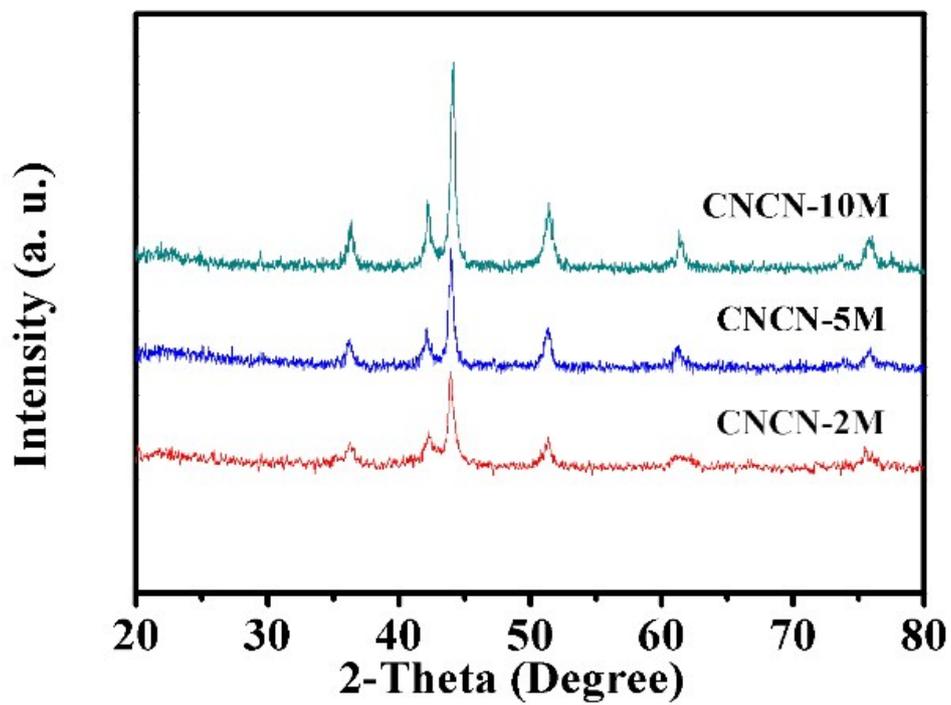


Figure S2. XRD patterns of the annealed CNCN-2M, CNCN-5M, and CNCN-10M, respectively.

Figure S3.

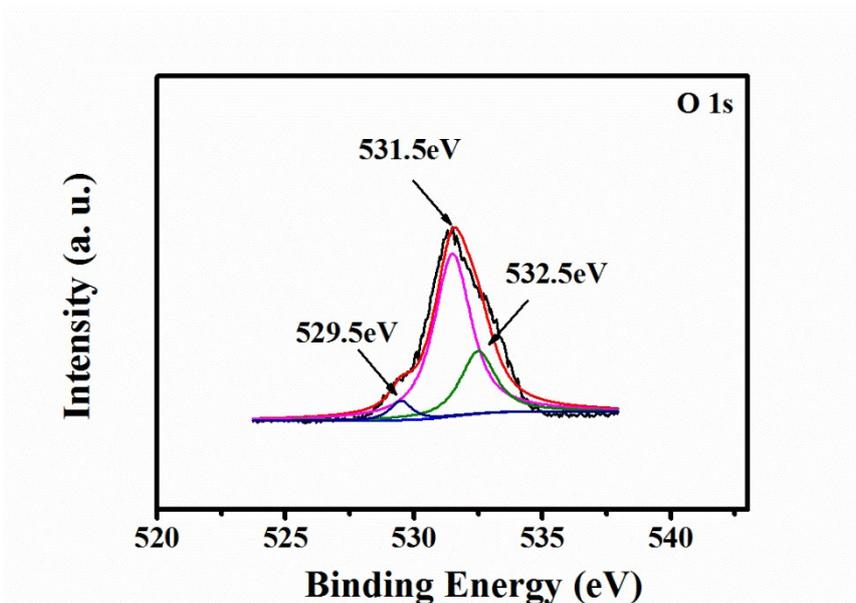
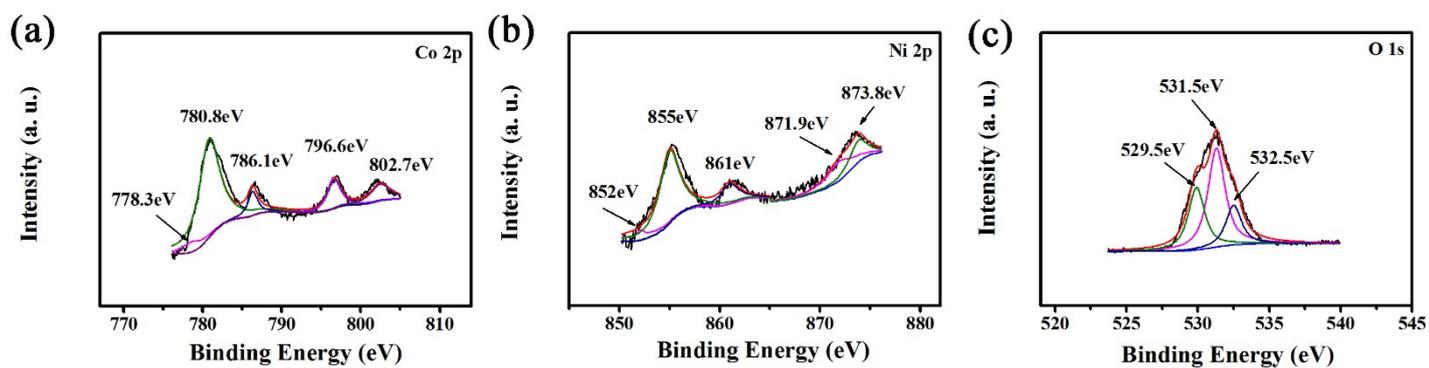


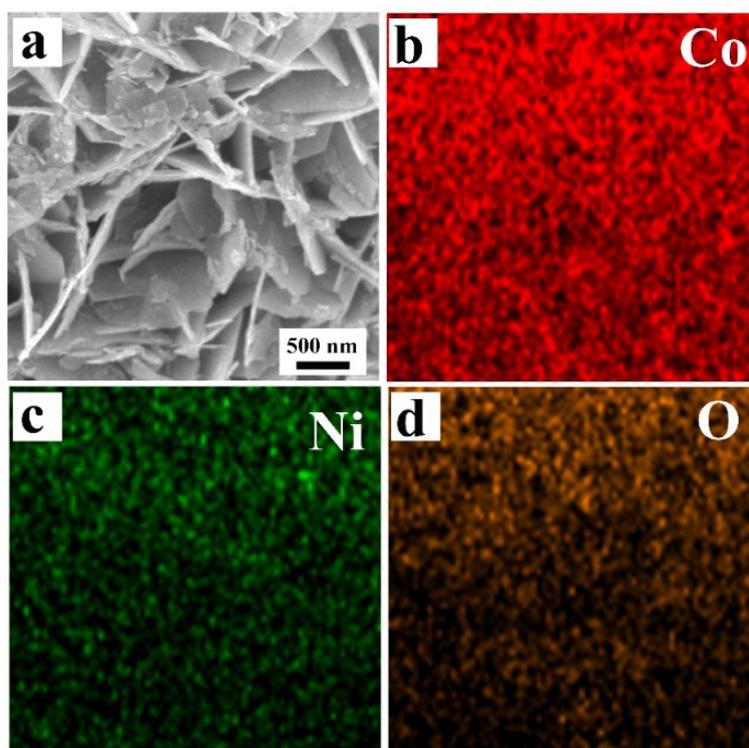
Figure S3. XPS spectra of the O for the fresh 5 M dealloyed samples.

**Figure S4.**



**Figure S4.** XPS spectras for the fresh 10 M dealloyed sample: (a) Co 2p, (b) Ni 2p, and (c) O 1s, respectively.

**Figure S5.**



**Figure S5.** (a) SEM image of the CNCN-5M electrode. The corresponding element mapping images of different elements: (b) cobalt, (c) nickel, and (d) oxygen, respectively.

Figure S6.

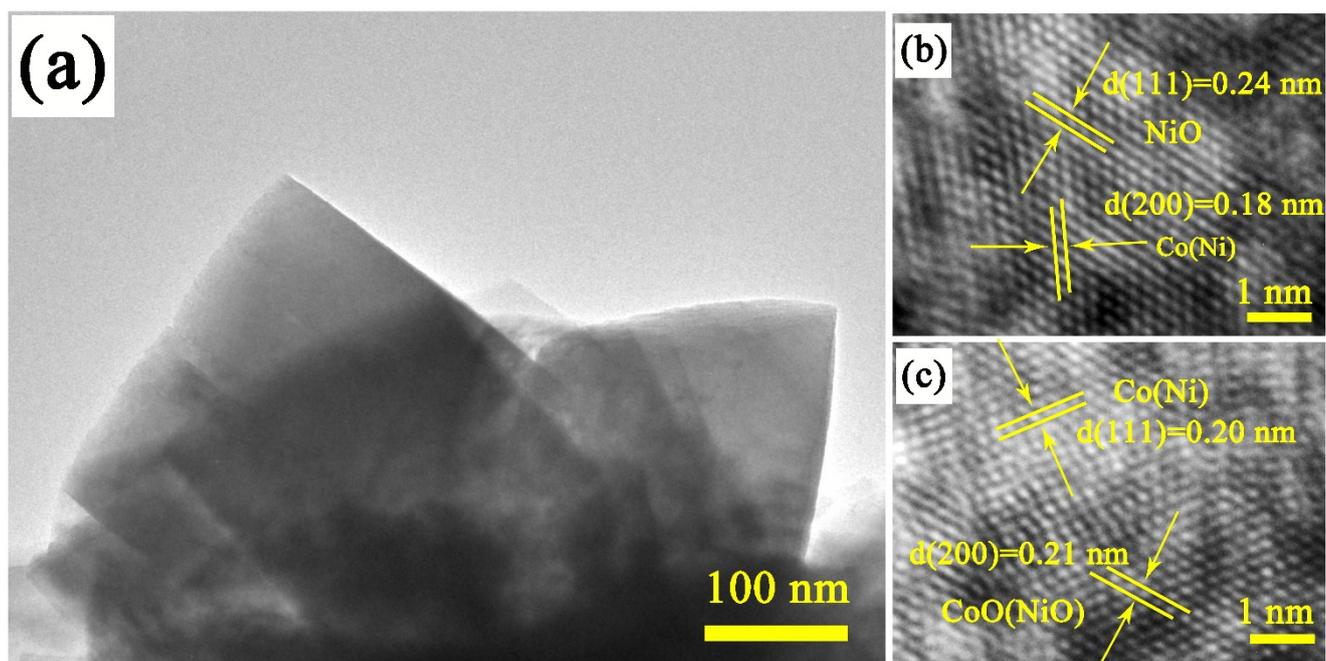
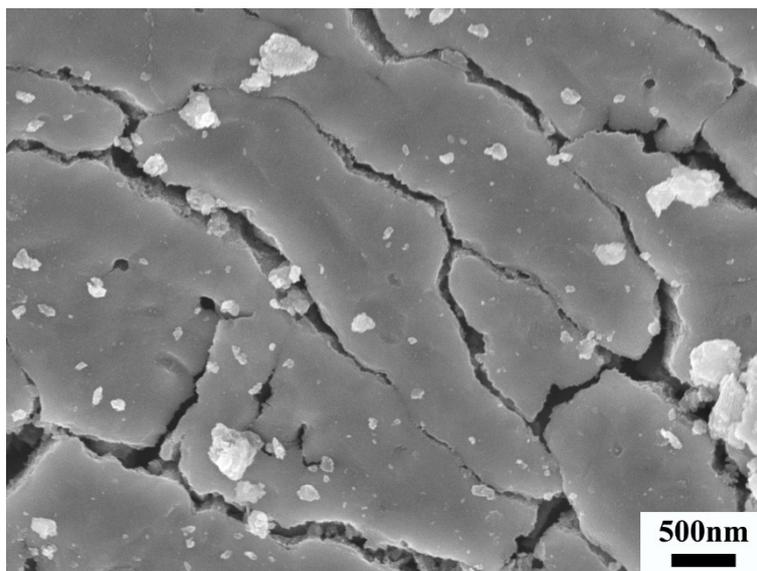


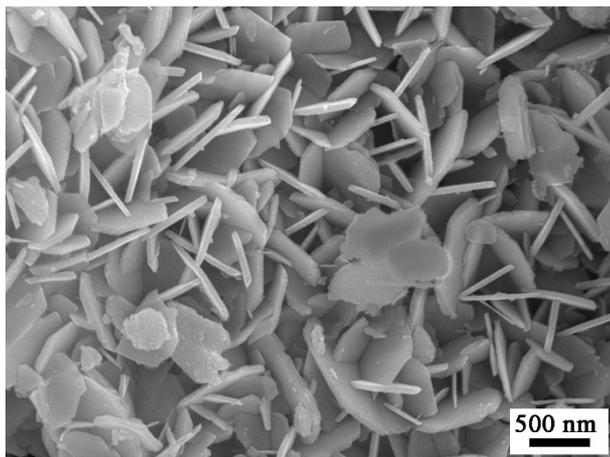
Figure S6. TEM and HRTEM image of the CNCN-10M products: (a) TEM image and (b)-(c) HRTEM image.

**Figure S7.**



**Figure S7.** SEM image of the product obtained by the pre-corrosion stage for 12 h.

**Figure S8**



**Figure S8.** SEM image of the annealed CNCN-5 M samples.