

Figure S1 CV curves at 1st and 100st cycle for the  $NiCr_2O_4$  electrode using a threeelectrode system.



Figure S2. The Ni 2p (a) and Cr 2p (b) core level spectra of NiCr<sub>2</sub>O<sub>4</sub> after cycles



Figure S3. SEM images of the  $NiCr_2O_4$  electrode before (a-b) and after (c-d) the charge/discharge cycles on the assembled  $NiCr_2O_4$  symmetric device