

Supporting information

Facile synthesis and catalytic performance of Co_3O_4 nanosheets in-situ formed on reduced graphene oxide modified Ni foam

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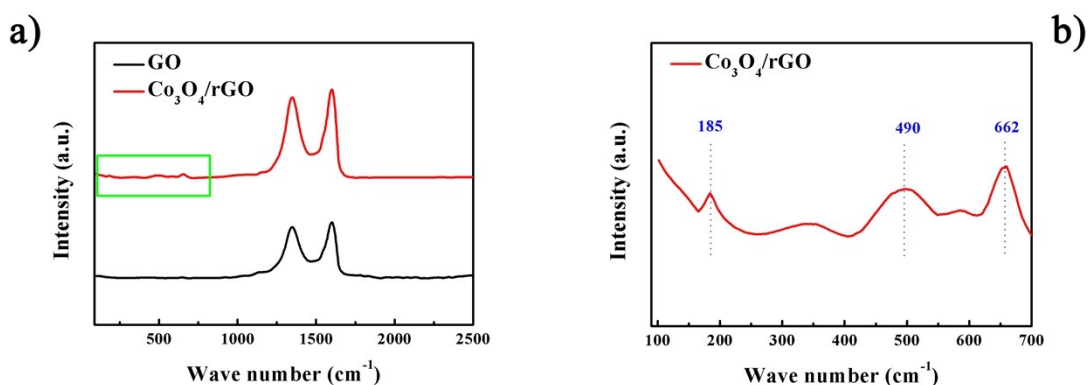


Figure S1 Raman spectra of $\text{Co}_3\text{O}_4/\text{rGO}$ and GO(a) and partial enlargement(b) of Figure S1(a)

Raman spectra of $\text{Co}_3\text{O}_4/\text{rGO}$ and GO were measured and shown in the following Figure S1. On both spectra of $\text{Co}_3\text{O}_4/\text{rGO}$ and GO, two remarkable peaks located at 1349 and 1598 cm^{-1} referring to the D and G bands respectively. The D band is arose from the edge or defect sites of carbon and the G band corresponds to ordered sp^2 -bonded carbon atoms. As seen from Figure S1(a), the spectra of $\text{Co}_3\text{O}_4/\text{rGO}$ and GO are very similar. When enlarging the region in Figure S1(a) marked by green

rectangle, it can be found from Figure S1(b) that three peaks at 185, 490 and 670 cm^{-1} which can be assigned to the E_g , F_{2g} and A_{1g} modes of Co_3O_4 indicating that $\text{Co}_3\text{O}_4/\text{rGO}@Ni$ foam electrode was successfully prepared.

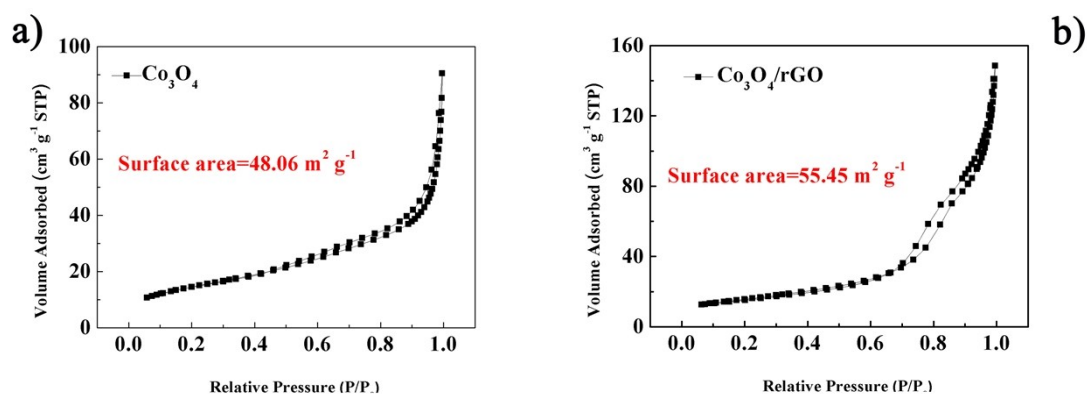


Figure S2. The N_2 adsorption/desorption isotherms of Co_3O_4 (a) and $\text{Co}_3\text{O}_4/\text{rGO}$ (b).

To investigate the surface area of $\text{Co}_3\text{O}_4@Ni$ foam and $\text{Co}_3\text{O}_4/\text{rGO}@Ni$ foam, N_2 isothermal adsorption-desorption measurements were conducted. The samples of Co_3O_4 and $\text{Co}_3\text{O}_4/\text{rGO}$ were obtained by scraping the powders from the Ni foam substrate. As seen from Figure S2, the N_2 adsorption-desorption isotherms of both Co_3O_4 and $\text{Co}_3\text{O}_4/\text{rGO}$ exhibit typical IV isotherms, indicating the mesoporous structures of Co_3O_4 and $\text{Co}_3\text{O}_4/\text{rGO}$. In addition, the results show a relatively high specific surface area of 55.45 $\text{m}^2 \text{g}^{-1}$ of $\text{Co}_3\text{O}_4/\text{rGO}$ which is higher than that of Co_3O_4 (48.06 $\text{m}^2 \text{g}^{-1}$). Thus, it can be concluded that the addition of rGO efficiently increases the surface area of the electrode and then leads to a better catalytic activity of the $\text{Co}_3\text{O}_4/\text{rGO}@Ni$ foam electrode than $\text{Co}_3\text{O}_4@Ni$ foam electrode.