Electronic Supplementary Information:

RGO enveloped vertically aligned Co_3O_4 nanowires on carbon fabric: A highly efficient prototype for flexible field emitter arrays

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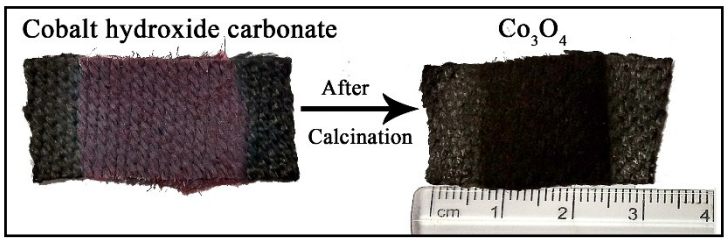

Figure S1: The uniform dark and intense black colour of the carbon fabric appear in the middle portion confirms the formation cobalt oxide on CF.

Synthesis of GO:

Graphene oxide was prepared from graphite powder by modified Hummer's method. The detailed experimental procedure is described as follows. A mixture of 2g of graphite powder

and 1g of sodium nitrate with 46 ml of conc. sulphuric acid (98% H_2SO_4) was first stirred for 6 hours at room temperature. Then the beaker with this mixture was placed in an ice bath and maintained the temperature at 10^oC or below 10^oC, not more than this. After that, 6g of $KMnO_4$ was added gradually with the mixture while keeping the temperature of the solution in between 10oC and stirring over a period around 30 min to form dilute and homogeneous mixture. Then the beaker removed from the ice bath and 120 ml distilled water was successively added drop wise into the mixture. Due to exothermic reaction large amount of heat produced and solution temperature increased to 98^oC and the solution turned brown colour. Kept the solution at that temp for some time and if necessary heat provided from external source to maintain that temperature. The beaker was then transferred in 35^oC water bath and stirred for 1 hour. After that 300 ml water was added with successive addition of 10 to 15 ml 30% H_2O to remove the excess $KMnO_4$. Finally the solution turned bright yellow colour and this was centrifuged and washed successively by HCl (5%) and water. After vacuum dry of the filtrate GO was obtained.

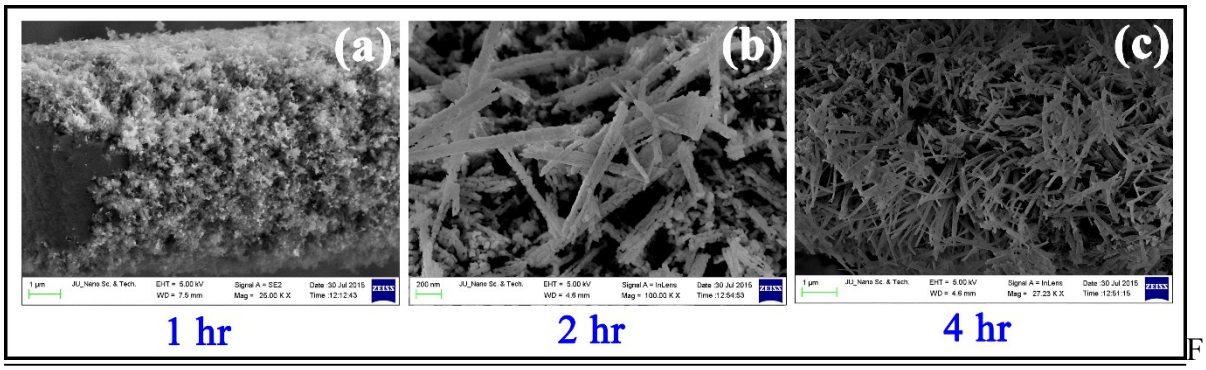

Figure S2: The evolution of the morphology and nanostructure of the resultant products (a) shows that at the hydrothermal reaction time 1 hr small Co_3O_4 nanoparticles were just started to form on the surface of the carbon fabric. (b) Increasing the reaction time to 2 hrs the nanowires of length nearly 1 μm has been observed and they are not totally aligned. (c) At 4 hrs the carbon fabric was almost fully covered by the NWs with length nearly 2 to 2.5 μm.

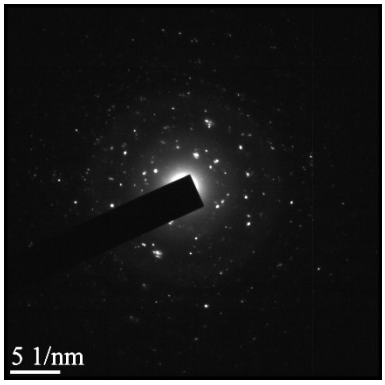

Figure S3: SAED pattern shows the polycrystalline nature of as synthesized Co_3O_4 NWs

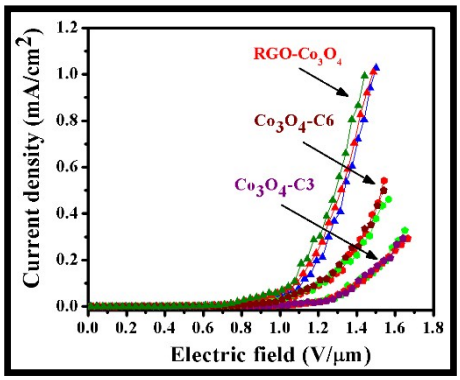

Figure S4: Field emission current density as a function of electric field for three different set of samples (RGO-Co_3O_4 NWs, Co_3O_4-C6 and Co_3O_4-C3).

Table T1: FE measurement of three different set of samples:

Sample	**Turn on (V/µm) at 10µA/cm^2**
Co_3O_4-C3	1.05 1.035 1.026
Co_3O_4-C6	0.85 0.867 0.88
RGO-Co_3O_4 (RGO-C6)	0.766 0.816 0.82