Supplementary information

Nickel-oxide multiwall carbon-nanotube/reduced graphene oxide a ternary composite for enzyme-free glucose sensing

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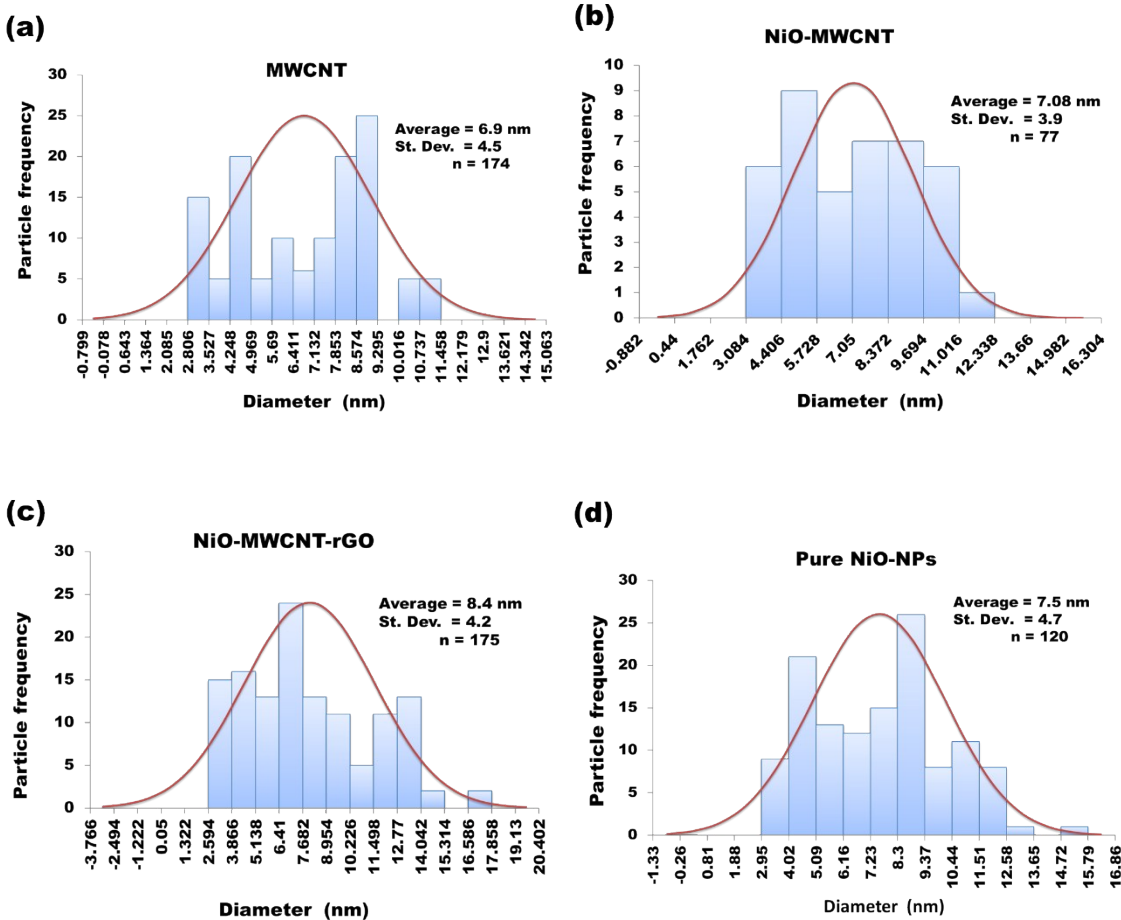* Corresponding author e-mail: chandpoorna@yahoo.com, Fax: +91 824 2474033

Fig. S1 The particle size distribution histograms and the corresponding Gaussian fits obtained for (a) MWCNT, (b) NiO-MWCNT composite, (c) NiO-MWCNT-rGO and (d) Pure NiO NPs respectively.
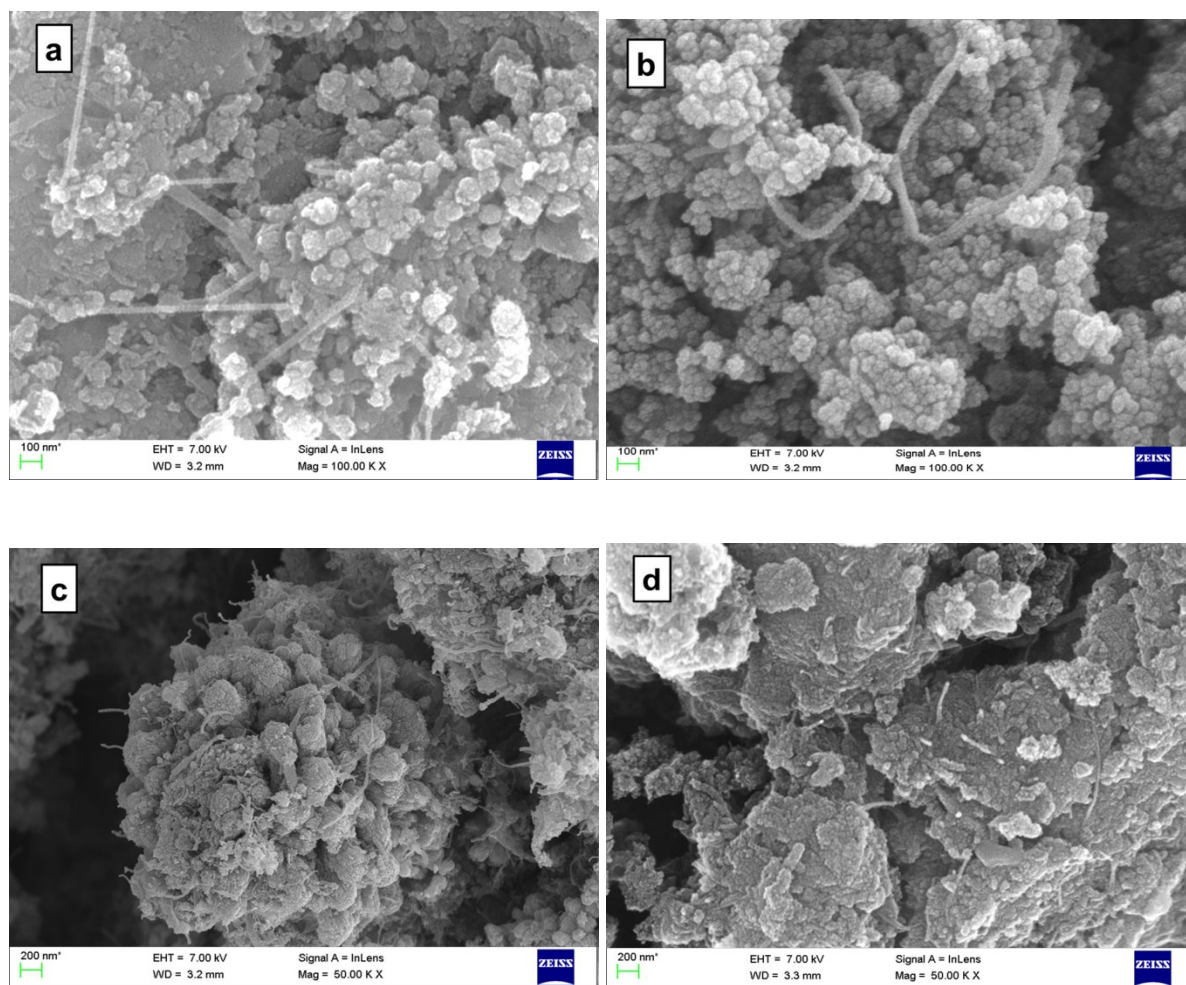
Fig. S2 FESEM images of (a) 10 wt. % NiO-MWCNT-rGO, (b) 20 wt. % NiO-MWCNT-rGO, (c) 30 % wt. NiO-MWCNT-rGO and (d) 40 wt. % NiO-MWCNT-rGO.

Figure S2 shows the FESEM images of NiO-MWCNT-rGO composites synthesized from different weight ratio of nickel formate precursor load, namely (a) 10 % NiO-MWCNTs-rGO, (b) 20 % NiO-MWCNTs-rGO, (c) 30 % NiO-MWCNTs-rGO and (d) 40 % NiO-MWCNTs-rGO for 10, 20, 30 and 40 wt. % precursor load respectively (Fig. S2 a-d). From these figures it is clearly observed that, as the precursor load increases from 10 to 40 wt.%, the NiO-NPs morphology on the surface of MWCNTs-rGO changes from nanoparticles to macroparticles. This increase in particle size with increase in precursor load can attribute to the agglomeration of

NiO particles. Hence, in case of 10 and 20 wt.% samples, lesser agglomeration with uniformly distributed NiO-NPs were observed, whereas with 30 and 40 wt.% samples, more agglomerated macro particles were observed. The order of samples with respect to particle size decorated is 40 % NiO-MWCNTs-rGO > 30 % NiO-MWCNTs-rGO > 20% NiO-MWCNTs-rGO >10 % NiO-MWCNTs-rGO. However, it is known that the NPs tend to have high surface area which in other words possess higher catalytic activity. Among these synthesized composite samples, 20 % NiO-MWCNTs-rGO (Fig. S2b) has uniformly distributed NiO-NPs with least agglomeration, hence it is considered as the best optimised ratio.