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Electronic Supplementary Information (ESI)

New insights into the role of lattice oxygen in the catalytic carbonization of polypropylene into high value-added carbon nanomaterials

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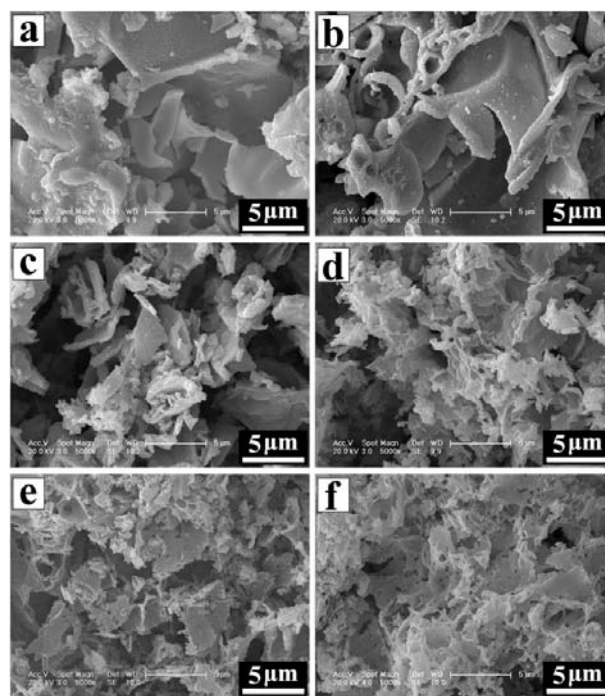
Fig. S1 FE-SEM images of nickel catalysts: (a) Cat-1.0, (b) Cat-1.25, (c) Cat-1.67, (d) Cat-2.5, (e) Cat-3.33 and (f) Cat-5.0.
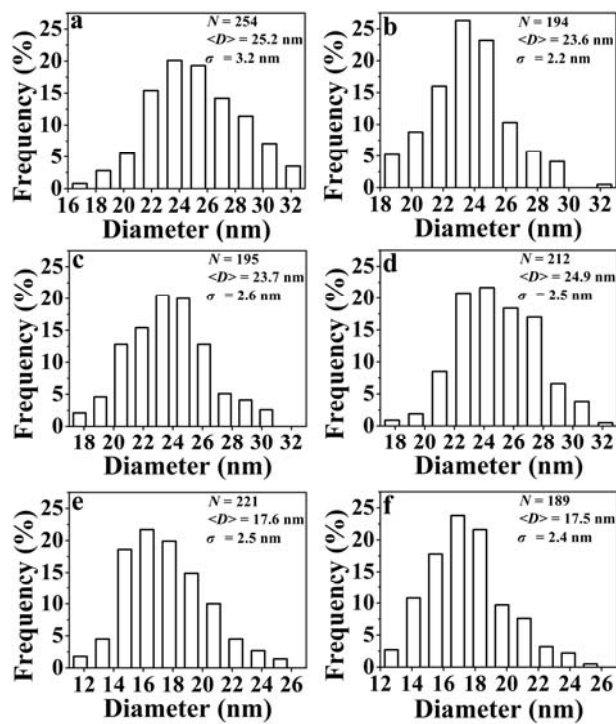
Fig. S2 The diameter distributions of nickel catalysts according to TEM images (Fig. 1): (a) Cat-1.0, (b) Cat-1.25, (c) Cat-1.67, (d) Cat-2.5, (e) Cat-3.33 and (f) Cat-5.0.
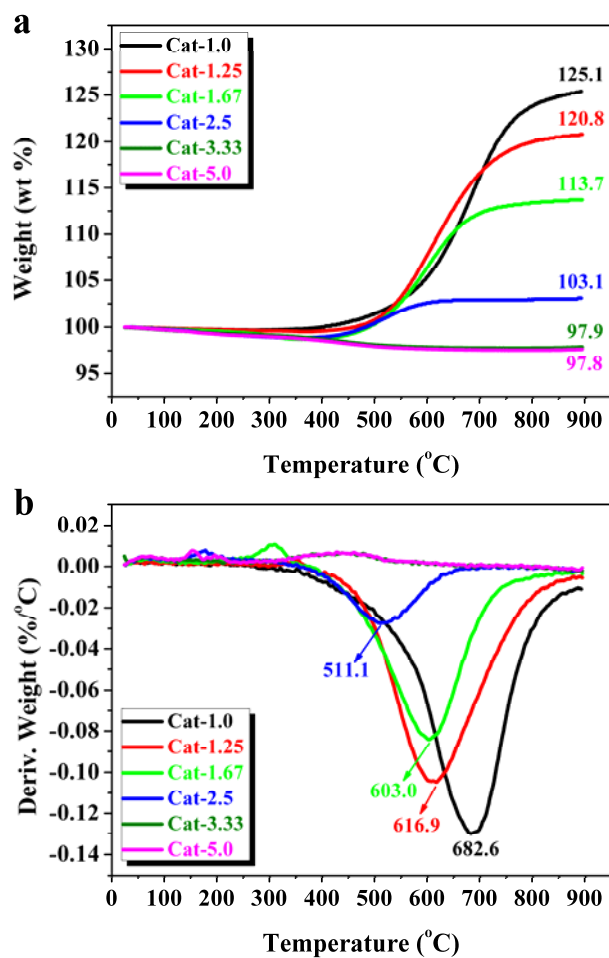
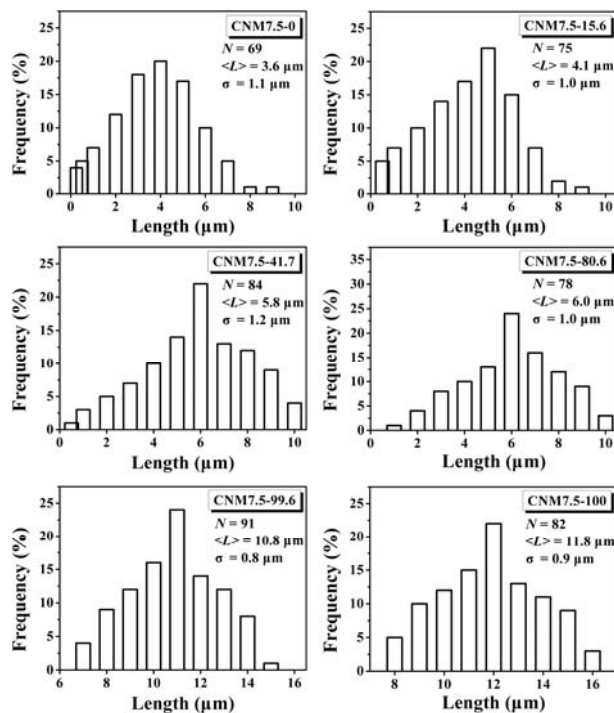**Fig. S3** TGA (a) and DTG (b) curves of nickel catalysts under air flow at 10 ^{o}C/min.

Fig. S4 Effect of the lattice oxygen content on the length distributions of CNMs.
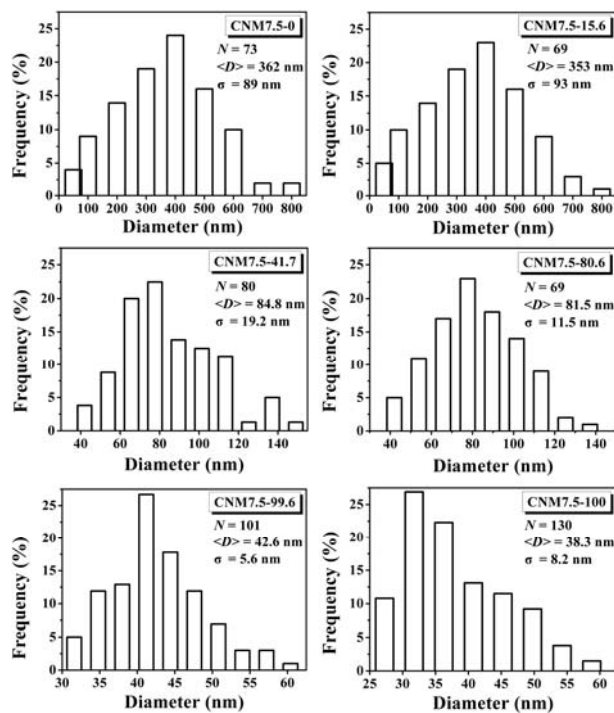

Fig. S5 Effect of the lattice oxygen content on the diameter distributions of CNMs.
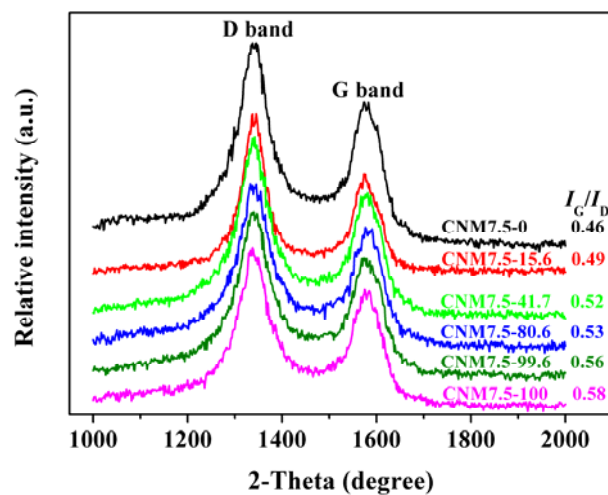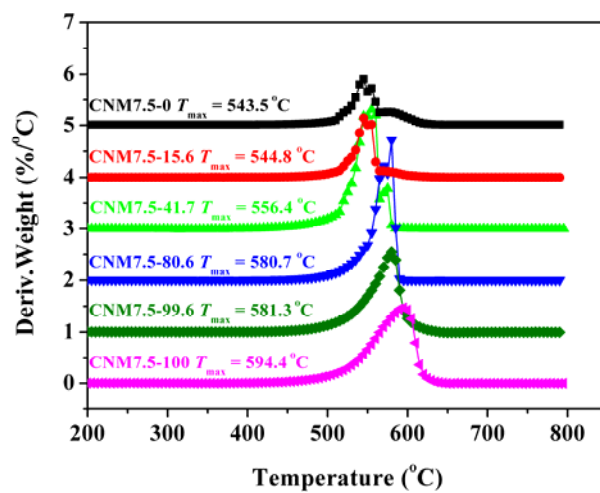
Fig. S6 Raman spectra of CNMs.

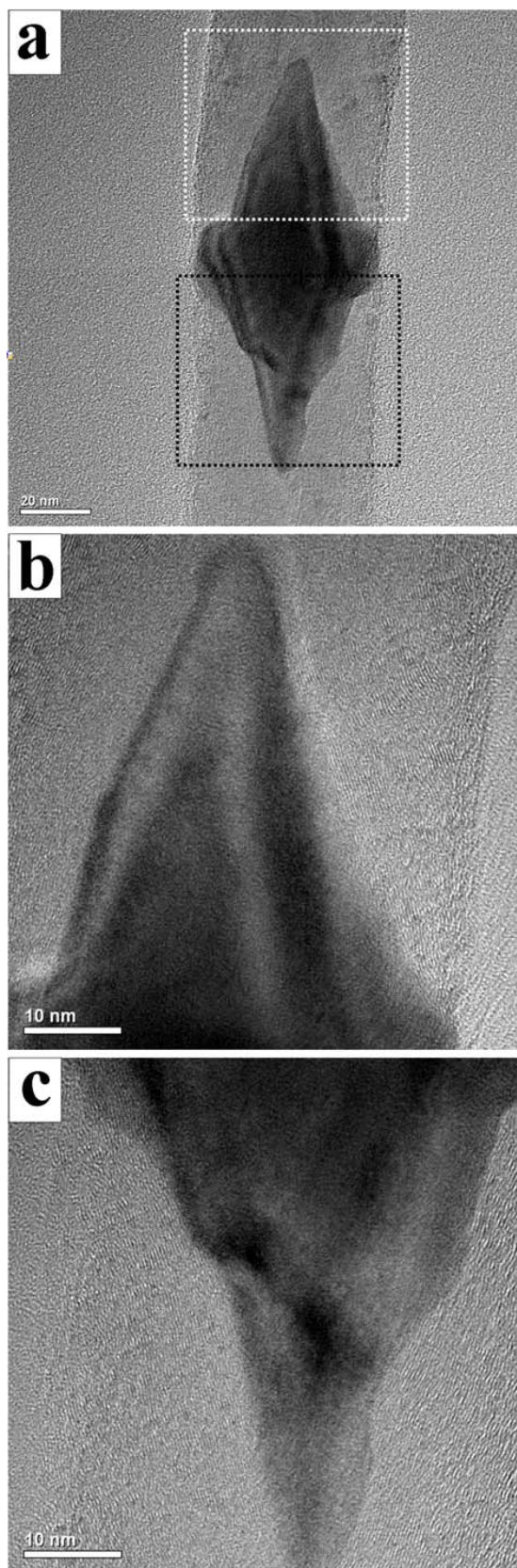**Fig. S7** DTG curves of CNMs under air atmosphere at 10 ^{o}C/min.

Fig. S8 HRTEM images of rhombic-shape Ni catalyst (a) with the graphene layers almost parallel to the surface of catalyst (b and c).
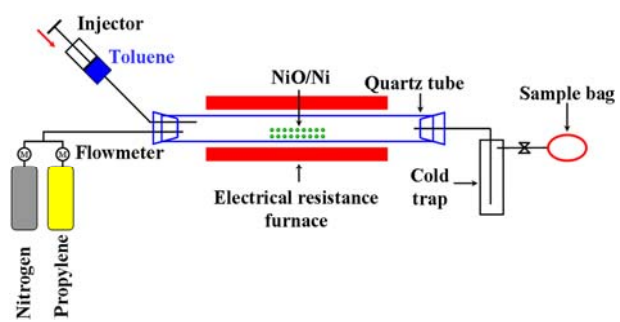
Fig. S9 Schematic diagram of the model carbonization experiment.