SUPPORTING INFORMATION

Microscopy investigations of the microstructure change and thermal response of the cobalt-based nanoparticles confined inside carbon nanotubes medium

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SI 1: XPS survey scan spectra of the pristine CNTs and those heated at 650°C in UHV. Inset: detailed scans of the O1s region. The oxygen atomic content is calculated from the O1s to C1s peak area ratio assuming a homogeneous distribution of the oxygen species in the analyzed volume.
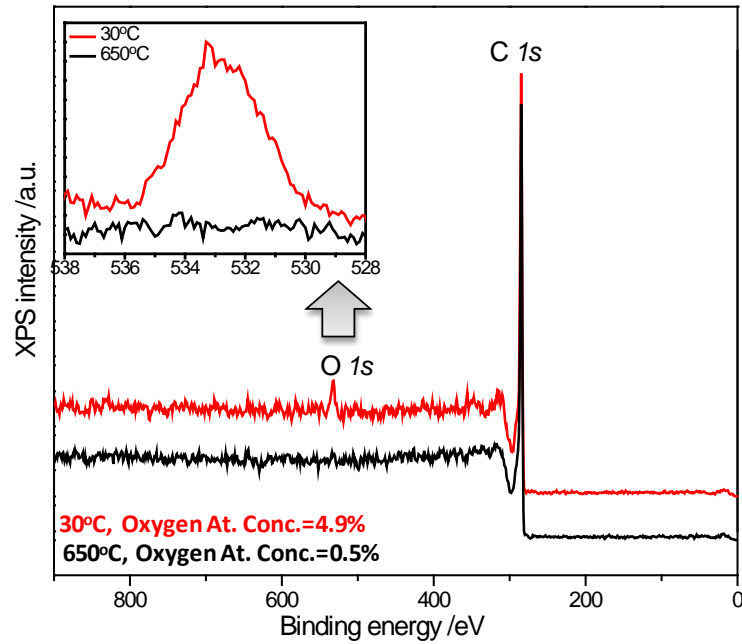

SI 2: TGA curve of Co-based NPs@CNTs carried out under air with a heating rate of 5°C/min. Size distribution of NPs measured from the TEM images (red lines) and fitted with a Gaussian function (black line).
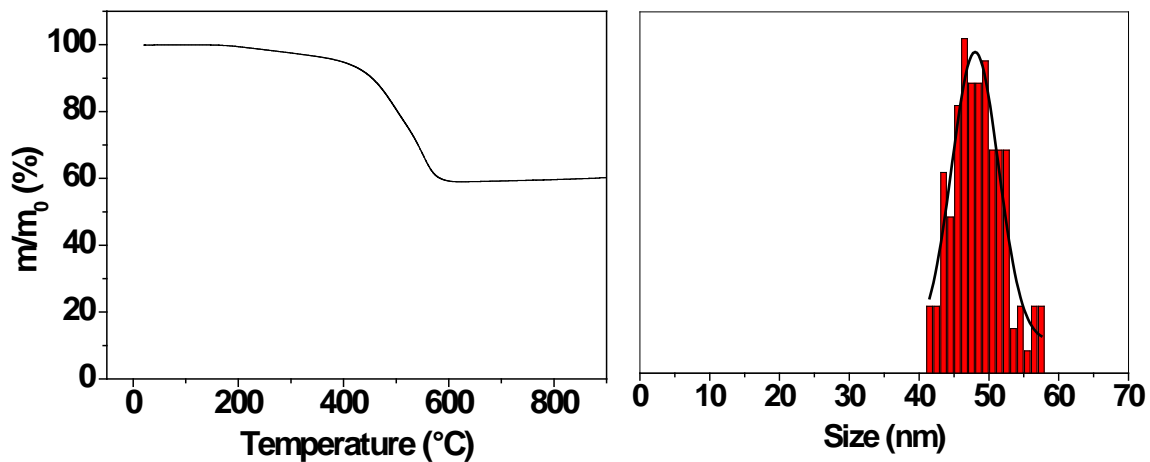
SI 3: TEM images of the Co-based/CNTs showing NPs localized inside the CNT's channel with closed end, confirming the high diffusion of the cobalt precursor inside the CNTs channel by the solvothermal method.
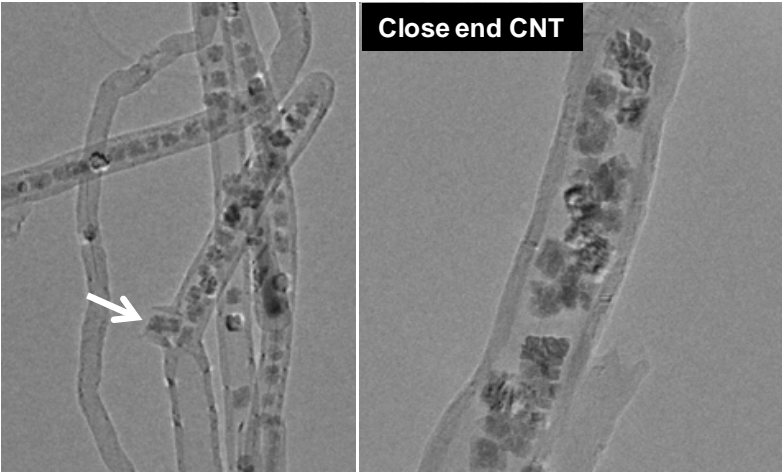
SI 4: Representative HAADF-STEM image and corresponding EELS spectra recorded on different areas on the nanostructures constituted of Co-based nanoparticles deposited on FLG sheets.
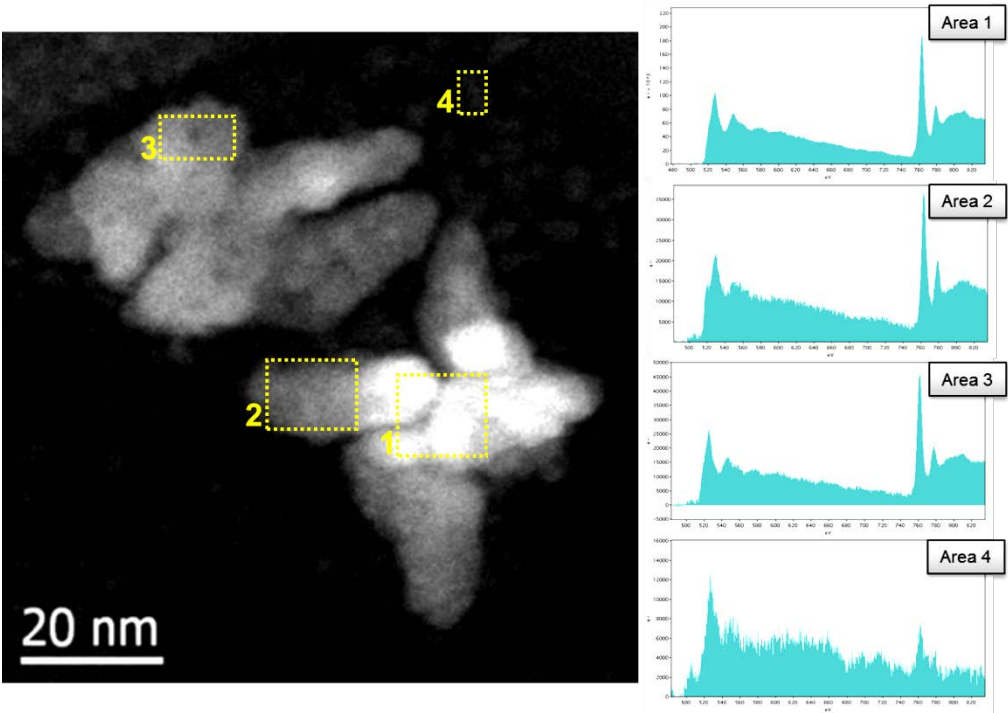
SI 5: TEM image of the CoO/FLG system illustrating a completely different morphology compared to that corresponding to the CoO/CNTs system where confinement effect operates.
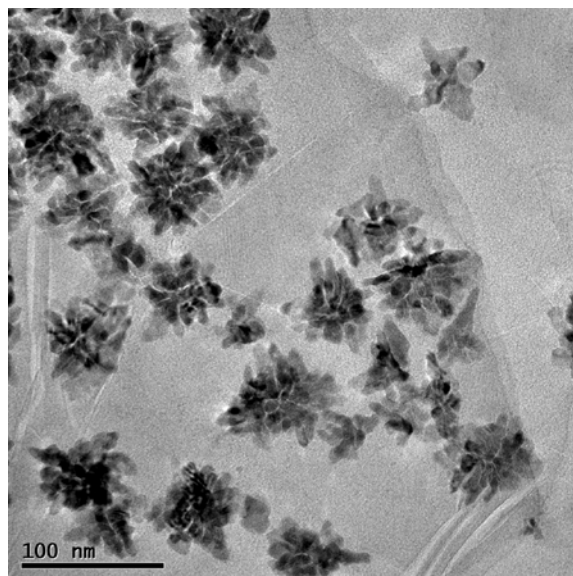
SI 6: Video of the 3D modeling

SI 7: HR HAADF-STEM analysis of Co-based NPs inside the CNTs