Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A

Preparation of Stable Cubic $LaFeO_3$ Nanoparticles Using Carbon Nanotubes as Templates

Oana Mihai[1], *Steinar Raaen*[2], *De Chen*[1*], *Anders Holmen*[1*]

[1] *Department of Chemical Engineering, Norwegian University of Science & Technology (NTNU), NO-7491 Trondheim, Norway*

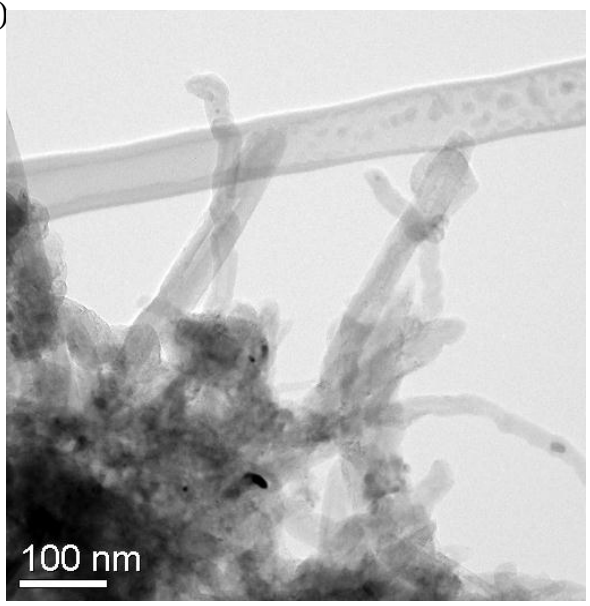
[2]*Department of Physics, Norwegian University of Science & Technology (NTNU), NO-7491 Trondheim, Norway*

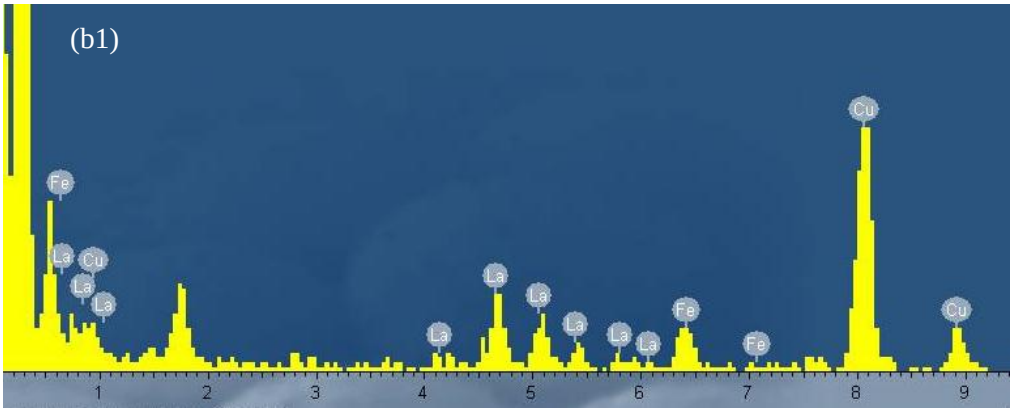
[*]*Email: chen@chemeng.ntnu.no*

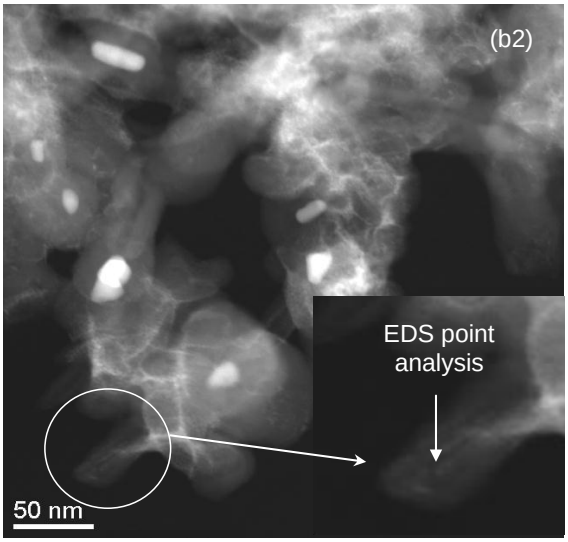
Supporting information

Scanning Transmission Electron Microscopy (STEM) and High Resolution TEM (HRTEM) experiments were performed using a JEOL 2010F microscope with a field emission gun, operated at 200 kV accelerating voltage. For the analysis of the sample composition, Energy Dispersive Spectroscopy (EDS) was performed using an Oxford Instrument INCA X-ray detector. TEM samples were prepared by dispersion of the crushed catalyst powder on a carbon supported Cu mesh grid.

(a)







Figures S1 (a-b). TEM images of the uncalcined LF-CNT catalyst

Figures S1 show TEM images of uncalcined LF-CNT catalyst and it suggests that the catalyst $LaFeO_3$ particles are located both inside and outside CNT. The EDS point analysis of the small catalyst particles inside the CNT show the presence of La and Fe elements.

The thermal stability of MWNT treated with nitric acid was investigated by TGA Instrument model Q500. A heating rate of 10°C/min up to 900°C was used. Helium and air were used as purge gases and the total flow rate was controlled at 100 mL/min.

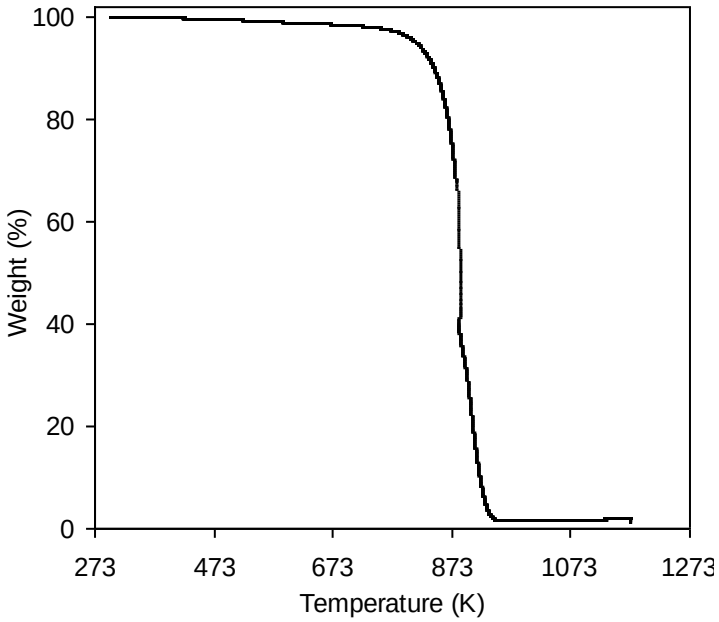


Figure S2. TGA analysis of MWNT purified with nitric acid

In Figure S2, TGA experiment indicates that the purified MWNTs loss the weight starting at about 773 K and very rapidly at about 833 K due to the oxidation. There are still about 2wt% residual remained.