

## Abstract

### Synthesis and Characterization of Bimetallic Core-shell Iron Oxides-Aluminum Oxide Nanoparticles

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Bimetallic core-shell nanoparticles have diverse potential applications due to their excellent physiochemical properties. In this work, we have developed a procedure for the synthesis of bimetallic core-shell iron oxide ( $\text{Fe}_2\text{O}_3$ )-aluminum oxide ( $\text{AlO}_x$ ) nanoparticles and characterized their physical and chemical properties. Aluminum oleate and iron oleate precursors were used for the synthesis of bimetallic core-shell  $\text{Fe}_2\text{O}_3$ - $\text{AlO}_x$  nanoparticles with the formation of  $\text{Fe}_2\text{O}_3$  in the first step and  $\text{AlO}_x$  in second step reaction. Oleic acid was used as a capping agent in the second step of reaction to prevent the aggregation of synthesized nanoparticles. Thus, obtained nanoparticles are separated using centrifuge technique and washed with hexane. Atomic force microscopic (AFM), Scanning electron microscopy (SEM), Transmission electron microscopy were used to characterize the size and shape of the nanoparticles. The elemental composition and structural properties will be investigated using Electron dispersive spectroscopy (EDS), X-ray photoelectron spectroscopy (XPS), and X-ray diffraction (XRD) instrument. The monolayer of core-shell  $\text{Fe}_2\text{O}_3$ - $\text{AlO}_x$  nanoparticles was developed on silicon substrate for the growth of vertically aligned carbon nanotubes (VA-CNTs).

**Key words:** Nanoparticles, Core-shell, Monolayer, Carbon nanotube.

## Biography of Presenter



I am Bishow Regmi, first year graduate student in the department of chemistry, university of Cincinnati. I have completed Master of science in chemistry from Tribhuvan university, Nepal. I am interested in material analytical chemistry and currently, I am working in Alvarez lab in the field of carbon nanotube synthesis. I got best poster presenter award in nano-bio micro symposium held at Darbarmarga, Kathmandu, Nepal.