

# 4<sup>th</sup> International Conference and Exhibition on **Materials Science & Engineering** September 14-16, 2015 Orlando, USA

## Raman spectroscopy of iron oxide of nanoparticles ( $\text{Fe}_3\text{O}_4$ )

Panta P C and Bergmann C P

Federal University of Rio Grande do Sul, Brazil

Nanoparticles of iron oxide ( $\text{Fe}_3\text{O}_4$ ) were obtained by co-precipitation with synthesis time of 30, 60 and 90 min. The morphology of the samples was investigated by transmission electron microscopy (TEM) and structural characteristics were obtained by X-ray diffraction (XRD). The crystallite size was calculated from the spectrum Xray diffraction with the application of the Scherrer equation and Winfit. The crystallite size varied from 4.6 to 14.4 nm when calculated by Scherrer equation and when calculated by the single line ranged from 7.5 to 22.3 nm Winfit. The degree of graphitization was studied by Raman spectroscopy where spectrums were analyzed with different lasers: 514 nm (0.75 mW power used) and 785 nm (1.2 mW power used). The dominant structures of the spectra are in 215, 276, 398, 487, 654 and 1300  $\text{cm}^{-1}$  when using the laser 514 nm. The spectrum produced with laser 514 nm is characteristic peak of magnetite in 654  $\text{cm}^{-1}$ . The spectrum produced by laser 785 nm has a peak at 670  $\text{cm}^{-1}$ , shifted relative to the laser 514 nm. The spectrum generated by laser 785 nm peaks characteristic of maghemiteen countered due to possible oxidation of the sample caused by the high power laser. The experimental results were satisfactory and are according to the survey.

### Biography

Panta P C is Postdoctoral student in the Department of Materials Engineering at the Federal University of Rio Grande do Sul, Brazil.

[pr.priscila@gmail.com](mailto:pr.priscila@gmail.com)

Notes: