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MS-1-P-3432 Lutetium Oxide Nanoparticles: Synthesis by a green method.

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The nanostructured systems present promising properties , optical, magnetic and catalyic properties. [1]. In particular a search for new designs at the nanometric scale has increased during the later years and its uses diversified.the interest in metallic oxides is due to applications in catalysis optical and electronic devices [2-5]. Lutetium oxide has uses in laser crystals optical devices and ceramics, because of the opossibility of obtaining with high purity it is considered as target for Xray emission because of its high density.

In general this compound is used as a dopant in the formation of granate for laser crystals. Since the oxides . are electrically non-conductive but by developing certain structures the electrical conductivity can be achieved and used in the cathode of Fuell-Cells and Oxygen generation systems. Being an anhydrous compound of basic character, it allows redox reactions, which helps in wáter electrolysis. Furthermore, since it is an insoluble compound, and very stable it can be used in the fabrication of cathodes of light ceramic structure in fuel-cells saving on weight. For the use of this oxide three important parameters are looked after: size, structure and elementary composition.

Lutetium Oxide nanoparticles were obtained in a high yield by means of biosynthesis with alfalfa. The morphology and crystal structure were characterized by high resolution transmission electron microscopy, EELS and Z-contrast microscopy. It is shown that the synthesis method employed produces small Lutetium Oxide nanoparticles, (2-5 nm), Lu2O3, as characterized from the optical diffractograms of individual particles.

The synthesis of Lu2O3 nanoparticles was done by the bioreduction method similar to the one proposed by G. Canizal [6], for gold nanoparticles . The synthesis was designed in principle to obtain nanoparticles of metallic Lu, but due to the characteristics of Lu the metallic oxide was obtained. Figure 1 shows size distribution function for Lutetium NP. Figure 2 shows pH7 HAADF of Lutetium NPs, Figure 3 presents HRTEM of Lu oxide particles, showing some have coalesced for pH7. Conclusion; The bioreduction method has been ueful to produce Lu2O3 NP of quantum size character.

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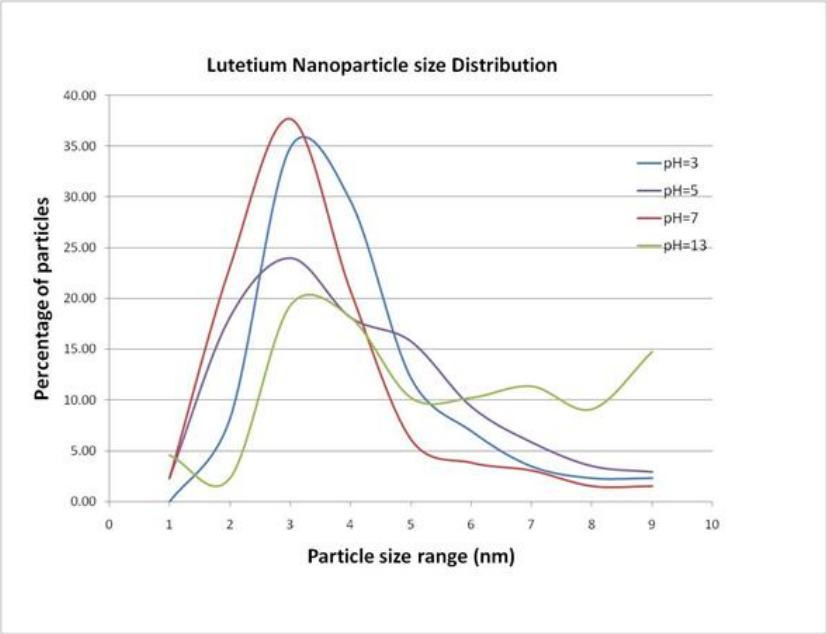

Fig. 1: Size distribution function for Lu Oxide NPs

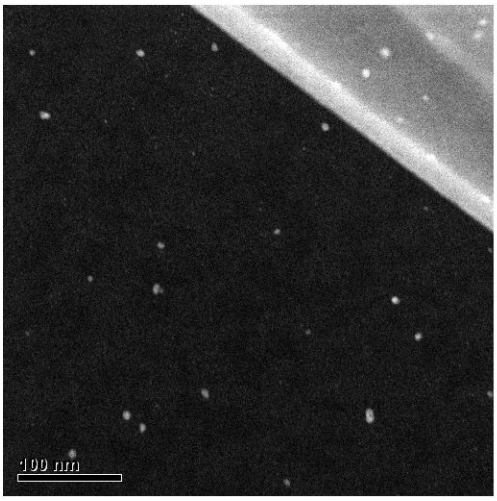

Fig. 2: HAADF showing Lutetium Nanoparticles distinct contrast.

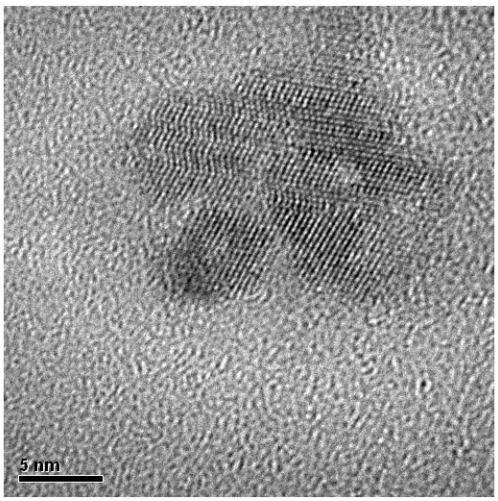

Fig. 3: Lutetium oxide nanoparticles, typical shapes and structures