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One-Step Synthesis of Silica Nanoparticles by Thermolysis of Rice Husk Ash Using Non Toxic Chemicals Ethanol and Polyethylene Glycol

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ABSTRACT

Amorphous silica nanoparticles were synthesized by injection of rice husk silica (RHA) silica diluted in ethanol into hot polyethylene glycol (PEG) solution at 180 °C and allowing the mixture for 2 h at 80 °C. The obtained product was characterized by X-ray diffraction (XRD), Fourier Transform Infrared spectra (FTIR) and transmission electron microscope (TEM). The results indicated that the amorphous structure of silica nanoparticles were successfully formed having well defined and regular spherical shape. TEM exhibits high concentrated particles with a size in the range of 65 to 70 nm whereas some few particles are peculiarly large. With this exception which induces an unexpected broad particle size distribution, the optical properties UV-vis absorption and photo luminescence of the obtained silica are in good agreement with those of previous conventional preparation techniques.

Keywords: Rice husk ash, thermolysis, nano silica, non toxic chemicals.