

Elaboration and Characterization of Silver Nanoparticles for Therapeutic and Environmental Applications

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Abstract : This survey research involves the elaboration and characterization of silver nanoparticles for therapeutic and environmental applications. The silver nanoparticles "Ag NPs" were synthesized by reducing AgNO₃ with microwaves. The characterization of nanoparticles was done by using Transmission Electron Microscopy " TEM ", Energy Dispersive Spectroscopy "EDS", Selected Area Electron Diffraction "SEAD", UV-Visible Spectroscopy and Dynamic Light Scattering "DLS". Transmission Electron Microscopy and Electron Diffraction have confirmed the nanoscale, the shape, and the crystalline quality of as synthesized silver nanoparticles. Elementary analysis has proved the purity of Ag NPs and the presence of the Surface Plasmon Resonance phenomenon "SPR". A strong absorption shift was observed in the visible range of the UV-visible spectrum of as synthesized Ag NPs, which indicates the presence of metallic silver. When the strong absorption in the ultraviolet range of the spectrum has revealed the presence of ionic Ag NPs ionic Ag aggregates species. The autocorrelation function measured by the Dynamic Light Scattering has shown a strong monodispersed character of Ag NPs, which is indicated by the presence of a single size population, with a minima and a maxima laying between 40 and 111 nm. Related to other research, our results confirm the performance properties of as synthesized Ag NPs, which allows them to be performing in many technological applications, including therapeutic and environmental ones.

Keywords : silvers nanoparticles, microwaves, EDS, TEM

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