

Bioremediation of Disposed X-Ray Film for Nanoparticles Production

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Abstract : The synthesis of silver nano particles (SNPs) extensively studied by using chemical and physical methods. Here, the biological methods were used and give benefits in research field in the aspect of very low cost (from waste to wealth) and safe time as well. The study aims to isolate and exploit the microbial power in the production of industrially important by-products in nano-size with high economic value, to extract highly valuable materials from hazardous waste, to quantify nano particle size, and characterization of SNPs by X-Ray Diffraction (XRD) analysis. Disposal X-ray films were used as substrate because it consumes about 1000 tons of total silver chemically produced worldwide annually. This silver is being wasted when these films are used and disposed. Different bacterial isolates were obtained from various sources. Silver was extracted as nano particles by microbial power degradation from disposal X-ray film as the sole carbon source for ten days incubation period in darkness. The protein content was done and all the samples were analyzed using XRD, to characterize of silver (Ag) nano particles size in the form of silver nitrite. Bacterial isolates CL4C showed the average size of SNPs about 19.53 nm, GL7 showed average size about 52.35 nm and JF Outer 2A (PDA) showed 13.52 nm. All bacterial isolates partially identified using Gram's reaction and the results obtained exhibited that belonging to Bacillus sp.

Keywords : nanotechnology, bioremediation, disposal X-ray film, nanoparticle, waste, XRD

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