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Synthesis, Characterization and Biospectroscopic Studies of Cadmium Oxide (CdO) Nanoparticles – Nucleic Acids Complexes Absence of Soluble Polymer as a Protective Agent Using Nucleic Acids Condensation and Solution Reduction Method

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Editorial

Cadmium Oxide (CdO) nanoparticles–nucleic acids complexes have been attracted more attention in the last decade, because of their anti–tumor, anti–bacterial and anti–microbial properties, their uses in cancer diagnostic, their liquid crystalline character, their structure–redox relationship and their Oxygen carrier catalyst properties [1-30]. In this editorial, synthesis of ten new Cadmium Oxide (CdO) nanoparticles–nucleic acids complexes with five different methods has performed. Also, their characterization and biospectroscopic studies of them were reported. These new Cadmium Oxide (CdO) nanoparticles–nucleic acids complexes are obtained from the nucleic acids condensation. The molecular structure and chemical properties of these anti–cancer Nano compounds were confirmed by [1] HNMR, [13] CNMR, [30] PNMR, Attenuated Total Reflectance Fourier Transform Infrared (ATR–FTIR), FT–Raman, UV–Vis and HR Mass spectroscopies. The biospectroscopic studies of these anti–cancer Nano compounds show a great significant importance of intermolecular Hydrogen bond in their structures.

On the other hand, among the various kinds of metal Oxide nanoparticles, Cadmium Oxide (CdO) nanoparticles have attracted more attention because of their potential applications in electronic, catalytic, magnetic materials and so on. Solution reduction method is a new technology for preparing Nano–scale particles in recent years. The size distribution and shape of which depend upon the pH value of the solution. Solution reduction method is performed in an organic solvent and aqueous cationic surfactant solution. It is observed that forming pure Cadmium Oxide (CdO) nanoparticles–nucleic acids complexes is relatively easy when the reaction is performed in an organic solvent instead of an aqueous solution. The synthesis reaction of Cadmium Oxide (CdO) nanoparticles–nucleic acids complexes absence of soluble polymer as a protective agent is better because it is difficult to remove completely on the particle surface by simple washing. Furthermore, it was observed that N_2 gas was produced and bubbled up continuously during reaction as revealed which created an inert atmosphere and hence the input of extra N_2 gas was not necessary for the synthesis of pure Cadmium Oxide (CdO) nanoparticles–nucleic acids complexes. In addition, the resultant Cadmium Oxide (CdO) nanoparticles–nucleic acids complexes could be magnetically recovered and re–dispersed without size change and agglomeration. The resultant particles have been confirmed by Scanning Electron Microscope (SEM), Transmission Electron Microscope (TEM), Differential Thermal Analysis–Thermal Gravim Analysis (DTA–TGA), Energy–Dispersive X–Ray Spectroscopy (EDX) and X–Ray Diffraction (XRD) analysis as being pure Cadmium Oxide (CdO) nanoparticles–nucleic acids complexes crystalline of (fcc) structure.

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