Editorial

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A Comparative Study on Simultaneous Determination and Separation of Adsorbed Cadmium Oxide (CdO) Nanoparticles on DNA/RNA of Human Cancer Cells Using Biospectroscopic Techniques and Dielectrophoresis (DEP) Method

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Editorial

During recent years the universal interest in trace elements has simulated a number of studies of their concentration and distribution in the human cancer cells, with the purpose of establishing the normal values and also to detect cancer, occupational cancer and toxic effects [1–21]. Nanoparticles exist in the environment and in a variety of compounds with different properties [22–32]. In this editorial, a novel, simple and sensitive direct method has been developed for determination of nanoparticles in human cancer cells using biospectroscopic techniques such as ^{1}HNMR, ^{13}CNMR, ^{31}PNMR, Attenuated Total Reflectance Fourier Transform Infrared (ATR–FTIR), FT–Raman, HR Mass and UV–Vis spectroscopies. The repeatability of the measurements of whole procedure was excellent. The accuracy and precision of the method has been investigated by measurement of nanoparticles in human cancer cells' samples and compared the results with H–Point Standard Addition Method (HPSAM)'s results. The results were in good, reasonable and acceptable agreement with the H–Point Standard Addition Method (HPSAM).

On the other hand, Dielectrophoresis (DEP) is a controlled movement of uncharged polarizable nanoparticles in a non–uniform electric field that used a separation method in human cancer cells [33–61]. In this editorial have been studied dielectrophoretic behaviors of human cancer cells and fine nanoparticles such as Cadmium Oxide (CdO) nanoparticles adsorbed on DNA/RNA of human cancer cells shows that the polarization of the nanoparticles is dominated by solution conductance. In this method, several kinds of electrode arrays are employed for separation.

Furthermore, in this editorial, the H–Point Standard Addition Method (HPSAM) based on biospectroscopic techniques such as ^{1}HNMR, ^{13}CNMR, ^{31}PNMR, Attenuated Total Reflectance Fourier Transform Infrared (ATR–FTIR), FT–Raman, HR Mass and UV–Vis spectroscopies for simultaneous determination of nanoparticles in human cancer cells is investigated. This method is based on the difference between their rates of reactions with Cadmium Oxide (CdO) nanoparticles in the presence of DNA/RNA of human cancer cells. The results showed that nanoparticles in human cancer cells can be determined simultaneously with the concentration ratios of Cadmium Oxide (CdO) nanoparticles varying from 1: 5 to 1: 50 in the binary mixture samples. It should be noted that under working conditions, the proposed method was successfully applied to the simultaneous determination of nanoparticles in human cancer cells.

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