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P173. CHARACTERIZATION OF ION IMPRINTED BASED NANOSENSOR FOR REAL TIME DETECTION OF Cu(II) IONS

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There are several trace elements in human body. Among these trace elements, Cu (II) plays an essential role in physiological processes in certain amounts. However, at elevated concentrations, Cu (II) can react with molecular oxygen to generate reactive oxygen species (ROS), suggesting their potential damage to biomolecules. In this regard, the residual level of Cu (II) in drinking water is restricted. The United States Environment Protection Agency (USEPA) sets a maximum contaminant level (MCL) of Cu (II) at 1.3 ppm (20 mM) in drinking water with regards to its toxicity. Therefore, it is important to develop highly sensitive and selective analytical methods for Cu (II) detection.

In aim of this study, for the first time, is to detect Cu (II) ions quantitatively in real time with high sensitivity and selectivity without any laboratory conditions and expensive instruments. The study targets to prepare a gravimetric nanosensor for the analysis of Cu (II) ions by combining the excellent selectivity properties of ion imprinted polymers (IIPs) and nanotechnology. Thus, Cu (II) imprinted IIP nanoparticles in a size range of 60 nm were prepared in the presence of N-methacryloyl-L-histidine functional monomer with 2:1 and 1:1 mol ratio. They were characterized by scanning electron microscopy (SEM), zeta size distribution analysis and FTIR spectroscopy. Cu (II) imprinted IIPs was then adapted to quartz crystal microbalance (QCM) nanosensor for the real time detection of Cu (II) ions in aqueous solutions. Several parameters, such as pH, initial ion concentration and selectivity will be investigated to obtain the optimum conditions of nanosensor efficiency.

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