



Cloud point extraction for spectrophotometric determination of nanosized copper oxide in food samples and using Taguchi orthogonal design to multivariate optimization

F. Malayjerdi^a, T. Heidari^{b*}, J. Zolghanein^a

^aDepartment of Chemistry, Faculty of Sciences, University of Arak, Arak, Iran

^bDepartment of Chemistry, Faculty of Basic Sciences, Ferdowsi University of Mashhad, Mashhad, Iran

Triton X-100 based cloud point extraction has been demonstrated to be an advantageous approach for the recovery of nanosized copper oxide [1-3] (NCO) from rice. Nano Copper Oxide in the initial aqueous solution was complexed with sodium diethyldithiocarbamate (NaDDC). Dilution of the surfactant-rich phase with acidified methanol was performed after phase separation and nano Copper Oxide contents were measured by UV-Visible spectrophotometric technique. The variables affecting the cloud-point extraction were optimized using Taguchi orthogonal array design. The effective factors including pH, extraction time, temperature extraction, amount of the triton X-100, concentration of salt and concentration of the ligand were studied and optimized. Under the optimized condition, the calibration graph was linear in the range of 1-30 $\mu\text{g}\cdot\text{L}^{-1}$ for Nano Copper Oxide. The limit of detection (LOD) was 0.93 $\mu\text{g}\cdot\text{L}^{-1}$. The relative standard deviation (RSD % n=7) for the determination of 10 $\mu\text{g}\cdot\text{L}^{-1}$ was 4.2%. The proposed method has been applied successfully to determine the trace amount of nano copper oxide in some of rice samples.

Keywords : Cloud point extraction; Nano Copper Oxide; Triton X-100; Food sample

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