dusts, tobacco smoke, food and some water supplies. Determination of Cd in water and food samples is an important screening procedure in the studies of environmental pollution and occupational exposure.
Cold vapor atomic absorption spectrometry (CVAAS) is a powerful technique for the determination of cadmium in aqueous samples. In order to improve the limit of detection, several different approaches including solid phase extraction [2], cloud point extraction [3] and preconcentration by in atomizer trapping of Cd vapour [4], have been proposed for the preconcentration of cadmium from aqueous samples.
In this study, Cadmium was quantitatively adsorbed from aqueous sample onto a microcolumn packed with cadion immobilized on sodium dodecyl sulphate coated TiO_2 NPs. The retained cadmium was eluted with 2.5 mol L^{-1} hydrochloric acid solution and measured by CVAAS. The influences of pH, amount of sorbent, volume sample solution, type and concentration of eluent, and flow rate of sample and eluent on the recovery of cadmium were investigated. With a 200 mL of sample volume a preconcentration factor of 100 was obtained. The relative standard deviation (RSD %) for 0.05 μg L^{-1} cadmium was 3.6%. The limit of detection based on three times the standard deviation of blank solution ($3S_b$) was 1.3 ng L^{-1}. The proposed method was applied to the determination of cadmium in water, fish and human hair samples.

Competitive transport of heavy metal cations across bulk liquid membranes containing phenylaza-15-crown-5 and cryptand 222 as carrier by flame atomic absorption spectrometry

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Liquid membranes represent an important tool in separation science. Compared with solvent extraction, liquid membranes have shown great potential since they combine the process of extraction and stripping in a single unit operation [1–3]. Especially in case where solute concentration is relatively low and other techniques cannot be applied efficiently. In this study, competitive transport procedure is proposed for separation of Zn(II), Cd(II), Cr(III), Co(II), Ag(I), Pb(II), and Ni(II) across bulk liquid membrane (BLM) using phenylaza-15-Crown-5 and cryptand 222 as chelating agent and chloroform, dichloromethane, 1,2-dichloroethane, and nitrobenzene, as extracting solvent. Interested elements were determined by atomic absorption spectrometry. The effect of the various parameters influencing the transport process, e.g. chelating agent, type of solvent used and effect of surfactant have been established. Observations show that the phenylaza-15-Crown-5 is an efficient carrier for the Ag(I) in the presence of seven metal cation, but no transport was observed for these metal cations by cryptand 222 in all membrane systems. The effect of solvent on the transport efficiency Ag^+ ion was found to be in the order of NB>DCM>$CHCl_3$>1,2 DCE. The transport of Ag^+ ion in $CHCl_3$–NB and DCM–1,2 DCE binary mixed solvents was sensitive to the solvent composition. A non-linear relationship was observed between the transport rate of silver (I) ion and the composition of these binary mixed solvents.
Keywords: Heavy metal cations; Bulk liquid membrane; Atomic absorption spectrometry

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Spectrometric determination of silver ions after selective bulk liquid membrane transport using phenylaza-15-crown-5 as carrier

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Selective transport of cationic substrates by membrane carriers is of great importance in chemistry, biology, and separation sciences. Compared with conventional separation processes, such as liquid-liquid extraction, membrane techniques are characterized by the technical simplicity and high efficiency in separating or enriching material from gaseous or liquid mixtures. Membrane techniques have been widely used for carrier facilitated metal ion separations [1-3]. Selective transport of silver(I) cation across a bulk liquid membrane(BLM) containing phenylaza-15-Crown-5 as carrier has been studied. The fundamental parameters influencing the transport of silver(I) ions such as the pH in the source and receiving phases, concentration of ion carrier in the organic phase, concentration of silver(I) cation in the source phase, volume of the receiving phase, type and concentration of surfactant in the receiving phase, and concentration of the stripping agent in the receiving phase have been optimized and accordingly, the amount of silver(I) transported across the liquid membrane after 4 h was 96.3±2% in the presence of $P_2O_7^{2-}$ as a suitable stripping agent. Moreover, the selectivity and efficiency of silver(I) ions transport from aqueous solution over other cations in ternary and quaternary mixtures have been investigated. The results indicate that our fabricated membrane is very sensitive toward Ag^+ ions in the presence of heavy metal ions.
Keywords: silver(I); Bulk liquid membrane; Phenylaza-15-crown-5.

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A Preconcentration Method Based on In-Situ Surfactant-based Solid Phase Extraction for the Spectrophotometric Determination of Quinoline Yellow in Foods, Soft drinks and Cosmetic products

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Synthetic colorants have been widely used in food industries compared to natural dyestuffs, because of their higher brightness, more stability, cheapness and the wider range of shades. The concentration of these additives must be carefully controlled as they may have various harmful effects on human health [1]. Quinoline yellow (QY), FD&C No:(E104), is widely used as an additive in soft drinks, foods, drugs and cosmetics. It may cause asthma, rashes and hyperactivity.Therefore,it is quite important and worthwhile to develop easy and reliablemethod for the detection of quinoline yellow in food products.A number of spectrophotometric, chromatographic and electrochemical methods for determination of QY have been proposed[2-4].
In this work, we used in-situ surfactant-based solid phase extraction for determination of QY in foods, soft drinks and cosmetic poducts. This method was introduced by Shemirani and co-workers in 2011[5].In this method, a cationic surfactant, n-cetyltriemethylammonium bromide (CTAB),wasinjected into the