Centri-Voltammetric Determination of Molybdenum (VI) In the Presence and Absence of 8-Hydroxyquinoline

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Centri-voltammetry is a novel technique which combines the advantages of voltammetry with centrifugation of precipitation. Precipitation, one of the oldest methods of separation and preconcentration, is still very useful as an enrichment technique [1]. Co-precipitation is used for the deposition of heavy metals on the electrode surface. Here, the analyte is preconcentrated with an appropriate carrier by means of centrifugation and is directly measured on the same electrode [2]. This technique offers an advantage of eliminating the filtration step when compared with the ASV technique.

Molybdenum plays an important role in water as pollutants or essential elements. It is an essential constituent of enzymes, therefore is biologically essential trace elements. Therefore, the determination of trace amounts of molybdenum alone in natural samples has been very important [3]. In this study, a determination method for molybdenum is developed by using centri-voltammetry. Oxine (8-hydroxyquinoline) is a well known complexing agent for many metal ions. Here, molybdenum ions are preconcentrated at the electrode surface via adsorption of its oxine complexes at controlled potential for a deposition period. On scanning the potential in negative direction, a reduction peak of the adsorbed complex appears at around -0.55 V. The parameters such as centrifugation speed, centrifugation time, pH, analyte and oxine concentration were optimized and a calibration curve was constructed in a concentration range of 5x10^{-6}-1x10^{-7} M in pH 2.3 HCl medium. The method offers a sensitive determination for molybdenum ions as it is viable to use larger volume of samples.

References