

ABSTRACT

Organic analytical reagents are the carbon compounds capable of reacting quantitatively with metal ions or the inorganic anions, resulting in the formation of a precipitate, an insoluble complex or a stable colour. Based on this type of reactivity the reagents are broadly classified as gravimetric or colorimetric reagents. In either case, it is observed that the chelating properties of the organic compounds play a significant role. The complex forming reagents are required to possess, the functional group capable of coordinating with the metal in concerned to form stable and coloured metal complexes.

The oximes and hydrazones are the most important spectrophotometric reagents for the determination of metal ions. Complex formation reactions are of great use in determining metal ions at the micro level or even Nano gram level, because of their complexing ability with metal ions giving highly colored stable compounds, in this context organic reagents occupy a better place over inorganic reagents. Among the large number available organic reagents, the hydrazones and oximes became important spectrophotometric reagents for the determination of metal ions.

Even though one cannot predict easily which organic compound is suitable for the analysis of a particular metal ion, some guidelines could be worked out on the basis of available data in the literature. It is observed that an organic compound is required to possess acidic or basic groups besides the group containing coordinating atoms to function as organic reagents.

The atomic groups involved in the coordination shall contain sulphur, nitrogen or oxygen as coordinating atoms. Presence of other atoms or groups in the compounds beside these two groups exerts a fundamental effect on the usefulness or otherwise of the organic compound as an analytical reagent. It is found that compounds containing $-\text{NO}$, $-\text{SH}$ and $-\text{OH}$, and serve as good organic reagents.

The precise determination of metal ions at micro gram level in the area of analytical chemistry has given added impetus to the analytical chemistry to discover simple, accurate and speedy methods. Moreover, the choice of selecting suitable method from the Innumerable methods present in the literature has also become difficult, Thus, in spite of the

availability of new methods and modern technique for the determination of metal ions, the demand for newer methods of analysis is increasing in view of the problems constantly faced by the analytical chemists from the complexity of the materials coming up for analysis.

Although for the determination of almost all the metal ions in periodic table at microgram level number of spectrophotometric methods are available, but they suffer either lack of selectivity or specificity. This necessitates develop more or less complicated procedures to overcome this determinatal influence. Because to achieve greater degree of selectivity the importance is to develop direct and derivative spectroscopic procedures for the determination of different metal ions when present admixture.

In literature, for the determination of metal ions by direct spectrophotometric methods are sparsely reported, in addition which is good background elimination technique. Which sanction the exact determination of λ_{\max} , make easy to the detection of poorly resolved peaks and also increases the selectivity and sensitivity of the spectrophotometric procedure.

The determination of low concentrations of metal is a vital task. Therefore, considerable efforts and progress have been carried out to develop reliable, low cost and accurate methods for metals determination in contaminated samples without any complicated processing step. The most common techniques in natural samples are atomic fluorescence spectrometry, X-rayfluroscence spectrometry, stripping voltammetry, Gas chromatography, ICP-AES atomic fluorescence, UV-Visible spectrophotometry and atomic absorption spectrophotometry were employed among them, spectrophotometric methods are preferred because they are accurate, cheaper and easy to handle.

In the light of the above problems due to pollutants in the environment investigations of Spectrophotometric methods using new reagents have been still in progress in academic institutions and in developing research laboratories. The Research Programme involves the following features and it is stated as plan of work.