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Research Paper :

Separation and identification of p-methoxy phenacylidene-p-dimethyl amino aniline-Cd(II), Fe(III), Mn(II), Cu(II) and Co(II) complexes by Thin Layer Chromatography

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ABSTRACT

Thin Layer Chromatographic study on separation and identification of metal complexes of p-methoxy phencyclidine-p-dimethyl amino aniline (Schiff Base) with Cd(II), Fe(III), Mn(II), Cu(II) and Co(II) has been carried out. For this, Silica Gel is used as adsorbent and the mixture of complexes was run on thin layer of Silica Gel; the R_f values of the complexes were determined in Methanol, Benzene-Acetone, Nitrobenzene-Methanol and Dioxane. The complexes were separated and were identified by comparing their R_f values and developing time. It was found that the extent of separation of complexes varied considerably with the nature of solvent systems employed and comes in Methanol > Benzene-Acetone > Nitrobenzene-Methanol > Dioxane order.

KEY WORDS : Thin layer chromatography, Amino aniline, Schiff base, Complexes

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Thin layer chromatography (TLC) is one of the most handy and rapid chromatographic techniques often used in the analysis of complex mixture of substances. Some workers have described TLC as open chromatography, spread chromatography or surface chromatography. Although a large number of workers have done a significant quantum of research employing TLC[1-6]. It is used for the separation and characterization of complex mixture. In this techniques, a thin layer of adsorbents are coated on glass plates. This technique was introduced by Izmailov and Shraiber in 1938[7]. After that this technique is developed by other workers[8-12]. It is extremely surprising to note that till 1960, TLC was not utilized for the separation and identification of mixture of inorganic compounds as well as metal ion complexes[13].

Some of the salient features of TLC may be given as follows[13]:

– This technique is rapid and makes possible the separation of even micro quantities of substances in a complex mixture in very short time.

– It is very efficient and the fractionations are sharper and cleaner than those of column or paper chromatography.

– The inorganic layers are free from background substances which would interfere with spectroscopic analysis and cause intrinsic fluorescence in paper chromatography.

– The chromatoplates may be heated to higher temperature for the detection of compound.

– A very high degree of reproducibility can be achieved and moreover many reactions may be monitored.

Literature survey reveals that, TLC is frequently employed for the separation and identification of metal ion complexes of Schiff Bases[8-13].

In view of the rapidity, efficiency, sensitivity and reproducibility afforded by TLC for the separation and identification of organic compounds, it was considered worthwhile to separate and characterized metal ion complexes.

The present study concerns with the separation and identification of the complexes of Cd(II), Fe(III), Mn(II), Cu(II) and Co(II) with p-methoxy-phenacylidene-p-dimethyl amino aniline.

EXPERIMENTAL METHODOLOGY

Complexes of Cd(II), Fe(III), Mn(II), Cu(II) and Co(II) with p-methoxy-phenacylidene-p-dimethyl amino aniline have been prepared by mixing two solutions in