SUMMARY AND CONCLUSION.
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The reactions between mono azo and bis azo dyes and ferron with copper and uranyl ions have been investigated here. The azo dyes have either o-hydroxyl substituents or the salicylic acid residue as the chelating groups.

Chapter I deals with the historical development of the co-ordination theory and its position in the light of modern theories of chemical combination. Importance and utility of co-ordination compounds has been traced in various fields. This chapter also includes the concise account of the factors affecting the stability of the co-ordination compounds. At the end the scheme of the current investigation is presented.

Various experimental procedures and principles for the study of co-ordination compounds have been described in Chapter II with special reference to those which have been followed here.

Account of chemicals and instrumental techniques used during the present investigation has been given in Chapter III.

Experimental data has been recorded in Chapter IV along with the plots for the data.

Chapter V deals with the discussion of the results obtained during the present investigation.

The methods applied for the investigation of chelate systems are:

(1) Vosburgh and Cooper method,
(ii) Method of continuous variation and (iii) Molar ratio method.

Effect of pH on the nature of chelate has been studied. Molar ratio method has also been applied at different pH and the method of continuous variation has been followed for determining the stability constants.

In summarising the results it may be mentioned that all the ligands used have given chelate compounds with copper while uranyl ion has failed to do so in a number of cases. Thus the results have borne out the fact that copper ion has got a greater tendency of chelate formation than uranyl ion.

Copper forms 1:2 (M:L) chelates in most of the cases except a few where it has given 1:1 chelates. Although there is a general decrease in the chelate forming tendency of copper ion in strongly acid medium, it is less affected than the uranyl chelates. Copper - ferron and copper - OCRME chelates give the indication of their existence near about pH 2 also. Copper forms apparently 1:1 chelate with a bis azo dye CASBFF but the actual ratio seems to be 2:2. The dye acts as a tetradentate ligand implicating 2 copper ions per two molecules of the dye.

Uranyl ion has been found to react with the dyes having salicylic acid residue or with an azo dye having two hydroxyl substituents in o-o' -position. It also reacts with ferron. It has failed to form chelate rings with azo groups having only one hydroxyl substituent in o-position. The
uranyl chelates have been found to be more affected by decrease in the pH of the medium.

Both copper and uranyl chelates are little affected by temperature or ageing after their formation.

The results obtained by Vosburgh and Cooper method lead to the conclusion that only one chelate exists in each of the systems under experimental conditions. No positive evidence has been obtained for the formation of more than one chelate even after investigating the chelate systems at different pH. Therefore it is concluded that only one chelate exists in each of the systems and the stoichiometric ratio of the components in every chelate is reliable and reproducible.

Stability constant values for the copper chelates with o-o' -dihydroxy azo dye, CT2R and Ferron are higher than those of the o-hydroxy azo dyes. Stability constant values for copper chelates in general are higher than those of the corresponding uranyl chelates except in the case of OCYK - uranyl chelate.

Both copper and uranyl ions are electronegative and possess $\delta^+$-donor character. The increased tendency of chelate formation shown by copper ion may be attributed to its smaller ionic radius and the nearly filled 3 d level. Strong field produced due to this nearly filled d-level seems to induce polarity on the donor atom of the ligand which may be responsible for its chelating tendency. The
formation of 1:1 chelate in the case of CASBFF with copper suggests that there is no contribution from the ether oxygen in chelate formation.

It may also be concluded that a single hydroxyl substituent in o-position to the azo group is insufficient to implicate the uranyl ion in chelate ring formation. The possible reason suggested for this is the greater ionic size of the uranyl ion. An additional hydroxyl group in o'-position to the azo group makes possible the chelate ring formation by uranyl ion. The increased nuclear charge causing a greater attraction for the ligand may be responsible for the chelate formation with the salicylic acid residue and ferron.