

Chapter 5

Conclusion

This work covered several aspects of the sulphate titration with barium perchlorate using dimethylsulphonazo III indicator: the use of various solvents, interfering ions, and the attempt to remove the interference by phosphate.

The preliminary studies found that aqueous-solvent mixture of titration medium contains 40-50% n-propanol (v/v) or acetone gave good and reproducible end-point.

The interference effect of foreign ion in the sulphate titration was studied. Among the nine cations and eight anions studied, it was found that the interference caused by Li^+ , Na^+ , K^+ , Mg^{2+} , Mn^{2+} , Cd^{2+} , NH_4^+ , Cl^- and Br^- are not significant. On the other hand, the presence of Cs^+ , Al^{3+} , F^- , I^- , SCN^- , BrO_3^- , NO_3^- and PO_4^{3-} in the system caused erroneous results. Cations such as lithium, sodium, potassium, ammonium, magnesium, cadmium and manganese do not interfere significantly. However, cesium and aluminium caused strong interference. Among the anions studied, phosphate, fluoride caused strong interference to the titration. Whereas, bromate, nitrate and thiocyanide caused moderate interference. The presence of chloride and bromide ions show no significant interference to the system. Among the ions studied, phosphate caused the strongest interference in the above sulphate titration.

Also, an accurate and simple titration method was developed for the determination of sulphate in the presence of phosphate. The phosphate was removed as magnesium ammonium phosphate by adding magnesium perchlorate solution in

alkaline condition. This method can be applied for determination of sulphate in presence of three fold excess of phosphate with respect to sulphate.