ISOTOPE EXCHANGE BEHAVIOUR OF BIS/DIETHYLDITHIO-CARBAMATE/MERCURY/II/ COMPLEX

P. Rama Devi, P.V.V. Prasada Rao, K. Sessaiah, G.R.K. Naidu

Department of Chemistry, S.V.U. College of Engineering, Tirupati - 517 502, India

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Isotope exchange behaviour of bis/diethyl-dithiocarbamate/mercury/II/ complex has been studied at 25 °C and 45 °C varying the concentrations of both metal ion and the complex. The results show that the complex is kinetically labile. Temperature has a significant effect on the rate of the reaction. Increase in concentration increases the reaction rate.

INTRODUCTION

Mercury contributes to air and water pollution as it forms a part of wastes from several industrial plants. Since mercury is highly toxic to life its removal from air and water has become necessary. Complexation with suitable ligands from one of the methods for the removal of mercury. The suitability of the method depends on

*To whom all correspondence should be addressed.
the lability of the complexes mercury forms with the ligand. Kinetic lability may be determined by studying the rate of exchange of metal or ligand by isotope exchange method. Thermal properties of bis/diethyldithiocarbamate/mercury/II/ complex was studied by D'Ascenzo et al. Metal chelate exchange study relating to bis/diethyldithiocarbamate/mercury/II/ complex was studied in carbon tetrachloride by Růžička. In the present investigation an attempt has been made to study the isotope exchange of mercury in bis/diethyldithiocarbamate/mercury/II/ complex.

EXPERIMENTAL

Materials and methods

Mercury/II/ chloride /BDH/, sodium diethyl dithiocarbamate /England/, chloroform /BDH/, acetone /BDH/, amyl acetate /BDH/, $^{197}$Hg tracer /supplied by Isotope Division BARC Trombay/ were used.

Procedure

Bis/diethyldithiocarbamate/mercury/II/ complex was prepared according to the method reported earlier. Solutions of mercury chloride /0.1x10^{-1}M in acetone/, bis/diethyldithiocarbamate/mercury/II/ complex /0.1x10^{-1}M chloroform/ were prepared. Reaction mixture was prepared by mixing 20 ml of mercury chloride and 20 ml of complex. Temperature of the reaction mixture was maintained at 25±1 °C and sufficient amount of $^{197}$Hg tracer /500 λ/ was added. The separation of free mercury from the complex was affected by adding a mixture of amyl acetate /2 ml/ and water /2 ml/ to a 2 ml aliquot of the reaction mixture withdrawn periodically. The activity of free