

Overall formation of complex ML_n

Now the formation of the complex ML_n may be expressed by the following steps and Equilibrium constants.

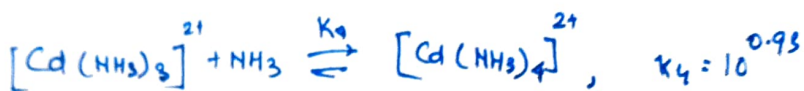
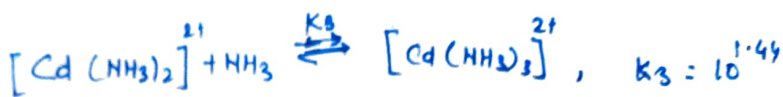
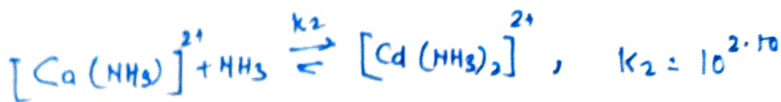
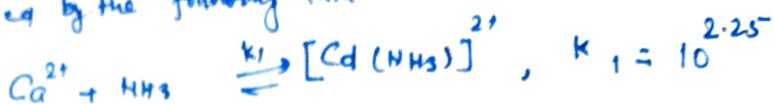


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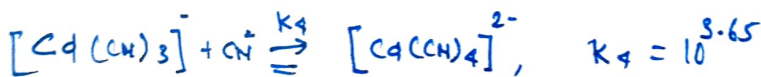
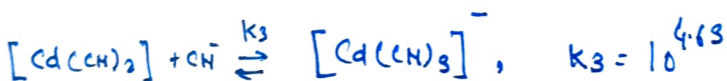
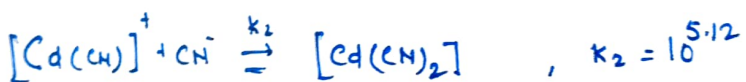
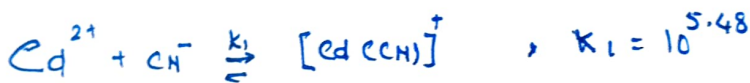
The Equilibrium constants, $\beta_1, \beta_2, \beta_3, \beta_4, \dots, \beta_n$ are called Overall or Cumulative formation constant.
 or, Overall or Cumulative Stability Constant.

The value of stability constant regularly decreases from K_1 to K_n . It is illustrated by the following data.



but value of $\beta_4 = 10^{7.12}$

2) When the Ligands are Charged Molecules: —



but, $\beta_4 = 10^{18.8}$

The steady decrease in the value of K_1, K_2, \dots, K_n with increasing number of ligands is due to the fact that as more and more ligands move into the co-ordination zone, then less and less aqua-molecules are available to fresh ligands for replacement.

As the number of ligands increases the metal ion becomes less greedy in the complex containing charged ligands, the important factors which is responsible for the steady decrease are statistical, steric hindrance and Coulombic factors.

The step wise stability constant is also expressed as $\log_{10} K_1, \log_{10} K_2, \dots, \log_{10} K_n$ and $\log_{10} \beta_n$ respectively.