Symbols in coordination equilibria.

Elements

ML_n symbolises a coordination compound in equilibrium in aqueous solution To simplify charges has been omitted.

n is an integer ($0 \le n \le N$) : it means the number of (monodentate) ligands - L – which are bound to the metal ion M.

The maximum coordination number is N.

ML_n is therefore a short notation for $ML_n(H_2O)_{N-n}$ (charges omitted).

M may be called metal ion, central ion or central atom

Concentration

$[ML_n]$ molar concentration of ML_n

C_X stoikiometric concentration of X - the molar concentration of X in total bound to the metal ions or free. Is often called the total concentration of X. Of typographical reasons it may also be written as C(X).

C_M Stoikiometric concentration of metal ion

C_L Stoikiometric concentration of ligand

The degree of formation

α_n The degree of formation of ML_n. (Of typographical reasons it may also be written as α(n))

$$\alpha_n = \frac{[ML_n]}{C_M}.$$

$\bar{n}$ The degree of formation of the system - (is pronounced n-mean).

$$\bar{n} = \frac{\sum n \cdot [ML_n]}{C_m}$$

Stability constant

K_n the step wise stability constant for the step $ML_{n-1} + L \Leftrightarrow ML_n$

$$K_n = \frac{[ML_n]}{[ML_{n-1}] \cdot [L]} = \frac{\alpha_n}{\alpha_{n-1} \cdot [L]}$$

β_n over all stability constant for the equilibrium $M + nL \Leftrightarrow ML_n$

$$\beta_n = \frac{[ML_n]}{[M] \cdot [L]^n} = \frac{\alpha_n}{\alpha_0 \cdot [L]^n}$$

$$\beta_n = \prod_0^n K_n$$