Q1. Explain the influence of ionic strength on the rate constant for each of the following reaction.

1. $PtCl_4^{2-} + OH^-$

2. $Pt(NH_3)_2Cl_2 + OH^-$

Answer: According to Brönsted-Bjerrum equation, for a second order reaction of type $A^{Z_A} + B^{Z_B} \rightleftharpoons X^{Z_A+Z_B} \longrightarrow P$, the effect of ionic strength in the rate constant of a reaction is given by

$$\log_{10} k = \log_{10} k_0 + 1.018\, Z_A Z_B \sqrt{I}$$

for aqueous solution at 25°C.

Here k and k_0 are the rate constants in the presence and absence of salt respectively.

Z_A and Z_B are the charges of the reactants A and B respectively and I is the ionic strength of the solution.

* In the first case, the reactants are of same charges and hence rate of the reaction increases with increase in ionic strength of the solution.
* Answer the second question.