Question:

1. When Fe3+ and SCN- react to form an equilibrium with FeSCN2+, what happens to the concentration of Fe3+? Explain your answer.

Answer:
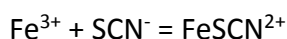
$Fe^{3+} + SCN^- = FeSCN^{2+}$
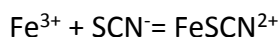
Concentration of Fe^{3+} decreases, because complex $FeSCN^{2+}$ ion is formed and it is stable in water.

Question:

2. How are the numbers of moles of FeSCN2+ produced and the number of moles of Fe3+ used up related to each other?

Answer:

$Fe^{3+} + SCN^- = FeSCN^{2+}$

$n(Fe^{3+}) = n(FeSCN^{2+})$

The numbers of moles of $FeSCN^{2+}$ and the number of moles of Fe^{3+} used up are the same. The ratio is 1:1.

Question:

3. In this experiment we assume that the complex ion formed is iron thiocyanate, FeSCN2+. It is however, possible to form Fe(SCN)2+ under some circumstances.

a. Write a reaction for the formation of this alternative ion.

b. Write the equilibrium constant expression for this reaction.

Answer:

    a. $Fe^{3+} + 2SCN^- = Fe(SCN)_2^+$

    b. $K_c = \dfrac{[Fe(SCN)_2^+]}{[Fe^{3+}][SCN^-]^2}$