CHEMISTRY

31. (4)

$K_1 = \frac{[NO_2]}{[NO][O_2]^{1/2}}$; $K_2 = \frac{[NO]^2[O_2]}{[NO_2]^2}$

$\Rightarrow \frac{[NO_2]^2}{[NO]^2[O_2]} = \frac{1}{K_2}$

$\Rightarrow \frac{[NO_2]}{[NO][O_2]^{1/2}} = \frac{1}{\sqrt{K_2}}$

$\Rightarrow K_1 = \frac{1}{\sqrt{K_2}}$; $K_2 = \frac{1}{K_1^2}$.

32. (3)

$K_p = K_c(RT)^{\Delta n}$

$\Delta n = -1$ for reaction $2SO_2 + O_2 \rightleftharpoons 2SO_3$

So for this reaction K_p is less than K_c.

33. (3)

For the reaction $H_2 + I_2 \rightleftharpoons 2HI$

$\Delta n = 0$. So $K_p = K_c \therefore 50.0$

34. (4)

Catalyst does not affect equilibrium constant.

35. (4)

K_p and K_c are characteristic for a given reaction if $\Delta n = 0$ then there is no change.

36. (1)

In this reaction gaseous molecule count

$MgCO_3 \rightarrow MgO_{(s)} + CO_{2(g)}$

$K_p = P_{CO_2}$

37. (1)

$2AB \rightleftharpoons A_2 + B_2$; $K_c = \frac{[A_2][B_2]}{[AB]^2}$

For reaction $AB \rightleftharpoons \frac{1}{2}A_2 + \frac{1}{2}B_2$

$K_c' = \frac{[A_2]^{1/2}[B_2]^{1/2}}{[AB]}$; $K_c' = \sqrt{K_c} = \sqrt{49} = 7$.

38. (1)

For this reaction Δn is negative and ΔH is positive so it take forward by decrease in temperature.

39. (2)

Chemical equilibrium of reversible reaction is not influenced by catalyst. It is affected by pressure, temperature and concentration of reactant.

40. (3)

ΔH is positive so it will shift toward the product by increase in temperature.