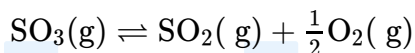


Questions

MathonGo

Q1 - 2024 (04 Apr Shift 2)

The equilibrium constant for the reaction



is $K_c = 4.9 \times 10^{-2}$. The value of K_c for the reaction given below is $2\text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{SO}_3(\text{g})$ is :

(1) 4.9

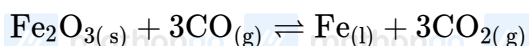
(2) 49

(3) 41.6

(4) 416

Q2 - 2024 (05 Apr Shift 1)

The following reaction occurs in the Blast furnace where iron ore is reduced to iron metal



Using the Le-chatelier's principle, predict which one of the following will not disturb the equilibrium.

(1) Addition of CO_2 (2) Removal of CO_2 (3) Addition of Fe_2O_3

(4) Removal of CO

Q3 - 2024 (06 Apr Shift 1)

At -20°C and 1 atm pressure, a cylinder is filled with equal number of H_2 , I_2 and HI molecules for the reaction



$x =$ _____

[Given : $R = 0.082 \text{ L atm K}^{-1} \text{ mol}^{-1}$]

(1) 0.01

(2) 10

(3) 2

Questions

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(4) 1

Q4 - 2024 (06 Apr Shift 2)

The ratio $\frac{K_P}{K_C}$ for the reaction : $\text{CO}_{(g)} + \frac{1}{2}\text{O}_{2(g)} \rightleftharpoons \text{CO}_{2(g)}$ is :

(1) $\frac{1}{\sqrt{RT}}$

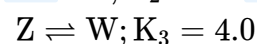
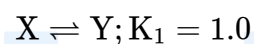
(2) $(RT)^{1/2}$

(3) RT

(4) 1

Q5 - 2024 (08 Apr Shift 1)

For the given hypothetical reactions, the equilibrium constants are as follows :



The equilibrium constant for the reaction $\text{X} \rightleftharpoons \text{W}$ is

(1) 6.0

(2) 12.0

(3) 7.0

(4) 8.0

Q6 - 2024 (08 Apr Shift 2)

The equilibrium $\text{Cr}_2\text{O}_7^{2-} \rightleftharpoons 2\text{CrO}_4^{2-}$ is shifted to the right in :

(1) an acidic medium

(2) a basic medium

(3) a neutral medium

(4) a weakly acidic medium

Questions

MathonGo

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Answer Key

/// mathongo // mathongo /// mathongo /// mathongo /// mathongo /// mathongo

Q1 (4) mathongo // ma **Q2 (3)** // mathongo **Q3 (2)** mathongo // mc **Q4 (1)** // mathongo

Q5 (4) mathongo // ma **Q6 (2)** // mathongo // mathongo // mathongo // mathongo

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Solutions

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Q1

$$K'_C = \left(\frac{1}{K_C}\right)^2 = \left(\frac{1}{4.9 \times 10^{-2}}\right)^2$$

$$K'_C = 416.49$$

Q2

When solid added no effect on equilibrium.

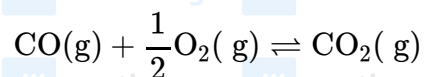
Q3

$$\Delta n_g = 0 \quad K_p = \frac{(n_{HI})^2}{n_{H_2} n_{I_2}} \left(\frac{P_T}{n_T}\right)^{\Delta n_g}$$

$$n_{HI} = n_{H_2} = n_{I_2} \quad \text{so } K_p = 1$$

$$1 = x \times 10^{-1} \quad x = 10$$

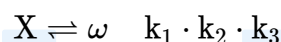
Q4



$$\Delta n_g = 1 - \left(1 + \frac{1}{2}\right) = -\frac{1}{2}$$

$$\frac{K_p}{K_C} = (RT)^{\Delta n_g} = \frac{1}{\sqrt{RT}}$$

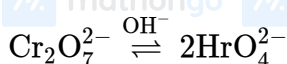
Q5



$$k = 1 \times 2 \times 4$$

$$k = 8$$

Q6



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