

CHEMISTRY · JEE MAIN

Chemical Equilibrium

Chapter-wise previous year questions, with answer key

52

PYQS

2020–2025

PAPERS

3

TOPICS

Kc and Kp

Law of Mass Action

Le Chatelier's Principle

- 1 Attempt each question on paper first. They're grouped by topic, newest papers first.
- 2 Check yourself against the answer key at the end.
- 3 Got one wrong? Tap "Step-by-step solution" under it for the full working.

Stuck on a question?

Every question has a free step-by-step solution on PrepWiser: tap "Step-by-step solution" under it.

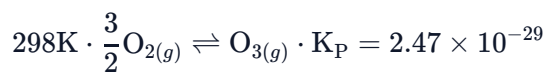
Practise this chapter online with instant answer checking: prepwise.in/learn · No signup needed to browse

Answers follow NTA's final answer keys. Typing errors are possible, so check doubtful answers against the official key. Spotted a mistake? prepwise.in/feedback · Terms: prepwise.in/terms

Kc and Kp · 2 PYQs

Q1 JEE Main 2024 · 31 Jan · Shift 1

Consider the following reaction at



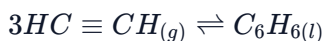
. $\Delta_r G^\ominus$ for the reaction is _____ kJ. (Given $R = 8.314\text{JK}^{-1}\text{mol}^{-1}$)

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/HykGxUzQBR](https://www.prepwiser.in/questions/HykGxUzQBR)

Q2 JEE Main 2021 · 24 Feb · Shift 2

Assuming ideal behaviour, the magnitude of $\log K$ for the following reaction at 25°C is $x \times 10^{-1}$. The value of x is _____. (Integer answer)



[Given : $\Delta_f G^\ominus(\text{HC} \equiv \text{CH}) = -2.04 \times 10^5 \text{ J mol}^{-1}$; $\Delta_f G^\ominus(\text{C}_6\text{H}_6) = -1.24 \times 10^5 \text{ J mol}^{-1}$; $R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$]

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/xlgMzTLwMX](https://www.prepwiser.in/questions/xlgMzTLwMX)

Law of Mass Action · 42 PYQs

Q3 JEE Main 2025 · 3 Apr · Shift 1

Given below are two statements :

Statement I : A catalyst cannot alter the equilibrium constant (K_c) of the reaction, temperature remaining constant.

Statement II : A homogenous catalyst can change the equilibrium composition of a system, temperature remaining constant.

In the light of the above statements, choose the correct answer from the options given below

- (A) Statement I is true but Statement II is false
- (B) Statement I is false but Statement II is true
- (C) Both Statement I and Statement II are true
- (D) Both Statement I and Statement II are false

[Step-by-step solution ► prepwiser.in/questions/_I079i7ocb](https://www.prepwiser.in/questions/_I079i7ocb)

Q4 JEE Main 2025 · 24 Jan · Shift 1

37.8g N_2O_5 was taken in a 1 L reaction vessel and allowed to undergo the following reaction at 500 K



The total pressure at equilibrium was found to be 18.65 bar.

Then, $K_p = \text{_____} \times 10^{-2}$ [nearest integer]

Assume N_2O_5 to behave ideally under these conditions.

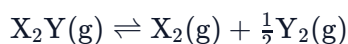
Given: $R = 0.082 \text{ bar L mol}^{-1} \text{ K}^{-1}$

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/LGaUh9C03Y](https://www.prepwiser.in/questions/LGaUh9C03Y)

Q5 JEE Main 2025 · 23 Jan · Shift 2

Consider the reaction



The equation representing correct relationship between the degree of dissociation (x) of $\text{X}_2\text{Y(g)}$ with its equilibrium constant K_p is _____.

Assume x to be very very small.

(A) $x = \sqrt[3]{\frac{K_p}{p}}$

(B) $x = \sqrt[3]{\frac{K_p}{2p}}$

(C) $x = \sqrt[3]{\frac{2K_p^2}{p}}$

(D) $x = \sqrt[3]{\frac{2K_p}{p}}$

[Step-by-step solution ► prepwiser.in/questions/AfsaNDIGGZ](https://www.prepwiser.in/questions/AfsaNDIGGZ)

Q6 JEE Main 2025 · 22 Jan · Shift 1

A vessel at 1000 K contains CO_2 with a pressure of 0.5 atm . Some of CO_2 is converted into CO on addition of graphite. If total pressure at equilibrium is 0.8 atm , then K_p is :

(A) 0.18 atm

(B) 0.3 atm

(C) 3 atm

(D) 1.8 atm

[Step-by-step solution ► prepwiser.in/questions/Ot-23InFO9](https://www.prepwiser.in/questions/Ot-23InFO9)

Q7 JEE Main 2024 · 8 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

(A) 12.0

(B) 8.0

(C) 6.0

(D) 7.0

[Step-by-step solution ► prepwiser.in/questions/VI0fB6UqQx](https://www.prepwiser.in/questions/VI0fB6UqQx)

Q8 JEE Main 2024 · 6 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 :

(A) 1

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

(C) RT

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

[Step-by-step solution ► prepwiser.in/questions/2J23H2yhAs](https://www.prepwiser.in/questions/2J23H2yhAs)

Q9 JEE Main 2024 · 6 Apr · Shift 1

At -20°C and 1atm pressure, a cylinder is filled with equal number of H_2 , I_2 and HI molecules for the reaction $\text{H}_2(\text{g}) + \text{I}_2(\text{g}) \rightleftharpoons 2\text{HI}(\text{g})$, the K_p for the process is $x \times 10^{-1}$.

$x = \underline{\hspace{2cm}}$.

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

(A) 2

(B) 1

(C) 10

(D) 0.01

[Step-by-step solution ► prepwiser.in/questions/fnAPOpucZX](https://www.prepwiser.in/questions/fnAPOpucZX)

Q10 JEE Main 2024 · 5 Apr · Shift 2

Given below are two statements :

Statement I : On passing $\text{HCl}_{(g)}$ through a saturated solution of BaCl_2 , at room temperature white turbidity appears.

Statement II : When HCl gas is passed through a saturated solution of NaCl, sodium chloride is precipitated due to common ion effect.

In the light of the above statements, choose the most appropriate answer from the options given below :

(A) Both Statement I and Statement II are correct

(B) Statement I is incorrect but Statement II is correct

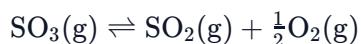
(C) Both Statement I and Statement II are incorrect

(D) Statement I is correct but Statement II is incorrect

[Step-by-step solution ► prepwiser.in/questions/RUt09k4wgg](https://www.prepwiser.in/questions/RUt09k4wgg)

Q11 JEE Main 2024 · 4 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 :

(A) 49

(B) 416

(C) 41.6

(D) 4.9

[Step-by-step solution ► prepwiser.in/questions/wQ5dV02v_g](https://www.prepwiser.in/questions/wQ5dV02v_g)

Q12 JEE Main 2024 · 31 Jan · Shift 2

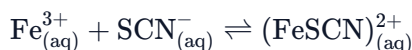
$A_{(g)} \rightleftharpoons B_{(g)} + \frac{C}{2}(g)$ The correct relationship between K_P , α and equilibrium pressure P is

- (A) $K_P = \frac{\alpha^{1/2} P^{3/2}}{(2+\alpha)^{3/2}}$
(B) $K_P = \frac{\alpha^{3/2} P^{1/2}}{(2+\alpha)^{1/2}(1-\alpha)}$
(C) $K_P = \frac{\alpha^{1/2} P^{1/2}}{(2+\alpha)^{3/2}}$
(D) $K_P = \frac{\alpha^{1/2} P^{1/2}}{(2+\alpha)^{1/2}}$

[Step-by-step solution ► prepwiser.in/questions/fzjaVZjFSU](https://www.prepwiser.in/questions/fzjaVZjFSU)

Q13 JEE Main 2024 · 31 Jan · Shift 1

For the given reaction, choose the correct expression of K_C from the following :-



- (A) $K_C = \frac{[Fe^{3+}][SCN^-]}{[FeSCN^{2+}]}$
(B) $K_C = \frac{[FeSCN^{2+}]}{[Fe^{3+}][SCN^-]}$
(C) $K_C = \frac{[FeSCN^{2+}]^2}{[Fe^{3+}][SCN^-]}$
(D) $K_C = \frac{[FeSCN^{2+}]}{[Fe^{3+}]^2[SCN^-]^2}$

[Step-by-step solution ► prepwiser.in/questions/FpGcYZV_T5](https://www.prepwiser.in/questions/FpGcYZV_T5)

Q14 JEE Main 2024 · 29 Jan · Shift 2

The following concentrations were observed at 500K for the formation of NH_3 from N_2 and H_2 . At equilibrium ; $[N_2] = 2 \times 10^{-2}M$, $[H_2] = 3 \times 10^{-2}M$ and $[NH_3] = 1.5 \times 10^{-2}M$. Equilibrium constant for the reaction is _____.

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/9etbBI0CKj](https://www.prepwiser.in/questions/9etbBI0CKj)

Q15 JEE Main 2024 · 29 Jan · Shift 1

For the reaction $N_2O_{4(g)} \rightleftharpoons 2NO_{2(g)}$, $K_P = 0.492atm$ at 300K. K_C for the reaction at same temperature is _____ $\times 10^{-2}$.

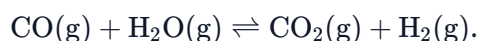
(Given : $R = 0.082Latmmol^{-1}K^{-1}$)

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/s_00ol5OS9](https://www.prepwiser.in/questions/s_00ol5OS9)

Q16 JEE Main 2023 · 11 Apr · Shift 1

A mixture of 1 mole of H_2O and 1 mole of CO is taken in a 10 litre container and heated to 725K. At equilibrium 40% of water by mass reacts with carbon monoxide according to the equation :



The equilibrium constant $K_C \times 10^2$ for the reaction is _____. (Nearest integer)

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/ccKL4ZLRsw](https://www.prepwiser.in/questions/ccKL4ZLRsw)

Q17 JEE Main 2023 · 10 Apr · Shift 2



For the given reaction, if the initial pressure is 450mmHg and the pressure at time t is 720mmHg at a constant temperature T and constant volume V . The fraction of $A(g)$ decomposed under these conditions is $x \times 10^{-1}$. The value of x is _____ (nearest integer)

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/Fe9dFHKU2d](https://www.prepwiser.in/questions/Fe9dFHKU2d)

Q18 JEE Main 2023 · 6 Apr · Shift 1

For a concentrated solution of a weak electrolyte (K_{eq} = equilibrium constant) A_2B_3 of concentration ' c ', the degree of dissociation ' α ' is :

- (A) $\left(\frac{K_{eq}}{25c^2}\right)^{\frac{1}{5}}$
(B) $\left(\frac{K_{eq}}{108c^4}\right)^{\frac{1}{5}}$
(C) $\left(\frac{K_{eq}}{5c^4}\right)^{\frac{1}{5}}$
(D) $\left(\frac{K_{eq}}{6c^5}\right)^{\frac{1}{5}}$

[Step-by-step solution ► prepwiser.in/questions/b16OTqGtL](https://www.prepwiser.in/questions/b16OTqGtL)

Q19 JEE Main 2023 · 6 Apr · Shift 2

The equilibrium composition for the reaction $PCl_3 + Cl_2 \rightleftharpoons PCl_5$ at 298K is given below:

$$[PCl_3]_{eq} = 0.2\text{molL}^{-1}, [Cl_2]_{eq} = 0.1\text{molL}^{-1}, [PCl_5]_{eq} = 0.40\text{molL}^{-1}$$

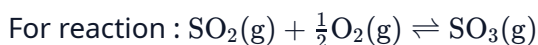
If 0.2mol of Cl_2 is added at the same temperature, the equilibrium concentrations of PCl_5 is _____ $\times 10^{-2}\text{molL}^{-1}$

Given : K_c for the reaction at 298K is 20

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/IJugBZ_Q01](https://www.prepwiser.in/questions/IJugBZ_Q01)

Q20 JEE Main 2023 · 31 Jan · Shift 1



$K_p = 2 \times 10^{12}$ at 27°C and 1atm pressure. The K_c for the same reaction is _____ $\times 10^{13}$. (Nearest integer)

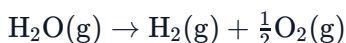
(Given $R = 0.082\text{LatmK}^{-1}\text{mol}^{-1}$)

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/Mc16TyCdDF](https://www.prepwiser.in/questions/Mc16TyCdDF)

Q21 JEE Main 2023 · 29 Jan · Shift 1

Water decomposes at 2300 K



The percent of water decomposing at 2300 K and 1 bar is _____ (Nearest integer).

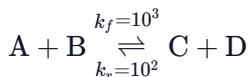
Equilibrium constant for the reaction is 2×10^{-3} at 2300 K.

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/p_tLePJJuK](https://www.prepwiser.in/questions/p_tLePJJuK)

Q22 JEE Main 2023 · 29 Jan · Shift 1

Consider the following reaction approaching equilibrium at 27°C and 1 atm pressure



The standard Gibb's energy change ($\Delta_r G^\theta$) at 27°C is (–) _____ kJ mol^{–1} (Nearest integer).

(Given : $R = 8.3 \text{ J K}^{-1} \text{ mol}^{-1}$ and $\ln 10 = 2.3$)

Numerical answer: enter the value.

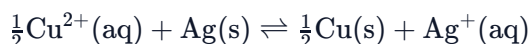
[Step-by-step solution ► prepwiser.in/questions/hx9KjcADMF](https://www.prepwiser.in/questions/hx9KjcADMF)

Q23 JEE Main 2022 · 26 Jul · Shift 1

At 298K, the equilibrium constant is 2×10^{15} for the reaction :



The equilibrium constant for the reaction



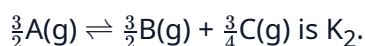
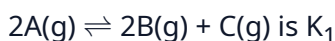
is $x \times 10^{-8}$. The value of x is _____. (Nearest Integer)

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/9RAYk0wQIi](https://www.prepwiser.in/questions/9RAYk0wQIi)

Q24 JEE Main 2022 · 30 Jun · Shift 1

The equilibrium constant for the reversible reaction



K_1 and K_2 are related as :

(A) $K_1 = \sqrt{K_2}$

(B) $K_2 = \sqrt{K_1}$

(C) $K_2 = K_1^{3/4}$

(D) $K_1 = K_2^{3/4}$

[Step-by-step solution ► prepwiser.in/questions/Ssq9PLNa0_](https://www.prepwiser.in/questions/Ssq9PLNa0_)

Q25 JEE Main 2022 · 29 Jun · Shift 2

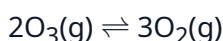
A box contains 0.90 g of liquid water in equilibrium with water vapour at 27°C. The equilibrium vapour pressure of water at 27°C is 32.0 Torr. When the volume of the box is increased, some of the liquid water evaporates to maintain the equilibrium pressure. If all the liquid water evaporates, then the volume of the box must be _____ litre. [nearest integer]

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

(Ignore the volume of the liquid water and assume water vapours behave as an ideal gas.)

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/-J1KRkfujS](https://www.prepwiser.in/questions/-J1KRkfujS)

Q26 JEE Main 2022 · 24 Jun · Shift 1

At 300 K, ozone is fifty percent dissociated. The standard free energy change at this temperature and 1 atm pressure is (–) _____ J mol^{–1}. (Nearest integer)

[Given : $\ln 1.35 = 0.3$ and $R = 8.3 \text{ J K}^{-1} \text{ mol}^{-1}$]

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/FZvsquHQdJ](https://www.prepwiser.in/questions/FZvsquHQdJ)

Q27 JEE Main 2021 · 26 Aug · Shift 1

The OH^- concentration in a mixture of 5.0 mL of 0.0504 M NH_4Cl and 2 mL of 0.0210 M NH_3 solution is $x \times 10^{-6}$ M. The value of x is _____. (Nearest integer)

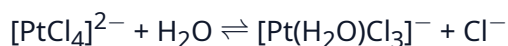
[Given $K_w = 1 \times 10^{-14}$ and $K_b = 1.8 \times 10^{-5}$]

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/LU8IzjgG-D](https://www.prepwiser.in/questions/LU8IzjgG-D)

Q28 JEE Main 2021 · 26 Aug · Shift 2

The reaction rate for the reaction



was measured as a function of concentrations of different species. It was observed that $\frac{-d[\text{PtCl}_4]^{2-}}{dt} = 4.8 \times 10^{-5} [\text{PtCl}_4]^{2-} - 2.4 \times 10^{-3} [\text{Pt}(\text{H}_2\text{O})\text{Cl}_3]^- [\text{Cl}^-]$.

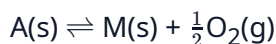
where square brackets are used to denote molar concentrations. The equilibrium constant $K_c =$ _____. (Nearest integer)

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/OtA9DnOTG4](https://www.prepwiser.in/questions/OtA9DnOTG4)

Q29 JEE Main 2021 · 27 Jul · Shift 2

The equilibrium constant for the reaction



is $K_p = 4$. At equilibrium, the partial pressure of O_2 is _____ atm. (Round off to the nearest integer)

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/-5FzcUIH7T](https://www.prepwiser.in/questions/-5FzcUIH7T)

Q30 JEE Main 2021 · 27 Jul · Shift 1



$K_c = 1.844$

3.0 moles of PCl_5 is introduced in a 1 L closed reaction vessel at 380 K. The number of moles of PCl_5 at equilibrium is _____ $\times 10^{-3}$. (Round off to the Nearest Integer)

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/sAaF-cxf5m](https://www.prepwiser.in/questions/sAaF-cxf5m)

Q31 JEE Main 2021 · 25 Jul · Shift 2

Assuming that $\text{Ba}(\text{OH})_2$ is completely ionised in aqueous solution under the given conditions the concentration of H_3O^+ ions in 0.005 M aqueous solution of $\text{Ba}(\text{OH})_2$ at 298 K is _____ $\times 10^{-12}$ mol L^{-1} . (Nearest integer)

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/c-GJHsNjF](https://www.prepwiser.in/questions/c-GJHsNjF)

Q32 JEE Main 2021 · 22 Jul · Shift 2

Value of K_p for the equilibrium reaction

$\text{N}_2\text{O}_{4(g)} \rightleftharpoons 2\text{NO}_{2(g)}$ at 288 K is 47.9. The K_C for this reaction at same temperature is _____. (Nearest integer)

($R = 0.083 \text{ L bar K}^{-1} \text{ mol}^{-1}$)

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/Ckn4SiPuEV](https://www.prepwiser.in/questions/Ckn4SiPuEV)

Q33 JEE Main 2021 · 20 Jul · Shift 1

$2\text{SO}_2(g) + \text{O}_2(g) \rightleftharpoons 2\text{SO}_3(g)$

In an equilibrium mixture, the partial pressures are

$P_{\text{SO}_3} = 43 \text{ kPa}$; $P_{\text{O}_2} = 530 \text{ Pa}$ and $P_{\text{SO}_2} = 45 \text{ kPa}$. The equilibrium constant $K_p = \text{_____} \times 10^{-2}$. (Nearest integer)

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/wq6QV6Xeyb](https://www.prepwiser.in/questions/wq6QV6Xeyb)

Q34 JEE Main 2021 · 18 Mar · Shift 2

The gas phase reaction $2A(g) \rightleftharpoons A_2(g)$ at 400 K has $\Delta G^\circ = + 25.2 \text{ kJ mol}^{-1}$.

The equilibrium constant K_C for this reaction is _____ $\times 10^{-2}$. (Round off to the Nearest Integer).

[Use : $R = 8.3 \text{ J mol}^{-1} \text{ K}^{-1}$, $\ln 10 = 2.3 \log_{10} 2 = 0.30$, $1 \text{ atm} = 1 \text{ bar}$]

[antilog $(-0.3) = 0.501$]

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/LbIXQdS-Sw](https://www.prepwiser.in/questions/LbIXQdS-Sw)

Q35 JEE Main 2021 · 17 Mar · Shift 2

Consider the reaction



The temperature at which $K_C = 20.4$ and $K_P = 600.1$, is _____ K. (Round off to the Nearest Integer).

[Assume all gases are ideal and $R = 0.0831 \text{ L bar K}^{-1} \text{ mol}^{-1}$]

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/Syv9ZvrR8_](https://www.prepwiser.in/questions/Syv9ZvrR8_)

Q36 JEE Main 2021 · 16 Mar · Shift 1

For the reaction $A(g) \rightleftharpoons B(g)$ at 495 K, $\Delta_r G^\circ = -9.478 \text{ kJ mol}^{-1}$.

If we start the reaction in a closed container at 495 K with 22 millimoles of A, the amount of B in the equilibrium mixture is _____ millimoles.

(Round off to the Nearest Integer). [$R = 8.314 \text{ J mol}^{-1} \text{ K}^{-1}$; $\ln 10 = 2.303$]

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/kAhbmriICa](https://www.prepwiser.in/questions/kAhbmriICa)

Q37 JEE Main 2021 · 24 Feb · Shift 1

At 1990 K and 1 atm pressure, there are equal number of Cl_2 , molecules and Cl atoms in the reaction mixture. The value of K_P for the reaction $Cl_{2(g)} \rightleftharpoons 2Cl_{(g)}$ under the above conditions is $x \times 10^{-1}$.

The value of x is _____. (Rounded off to the nearest integer)

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/H8BvYyBNxr](https://www.prepwiser.in/questions/H8BvYyBNxr)

Q38 JEE Main 2021 · 24 Feb · Shift 1

For the reaction $A_{(g)} \rightarrow B_{(g)}$ the value of the equilibrium constant at 300 K and 1 atm is equal to 100.0.

The value of $\Delta_r G$ for the reaction at 300 K and 1 atm in J mol^{-1} is $-xR$, where x is _____. (Rounded off to the nearest integer)

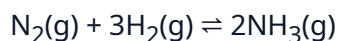
[$R = 8.31 \text{ J mol}^{-1} \text{ K}^{-1}$ and $\ln 10 = 2.3$]

Numerical answer: enter the value.

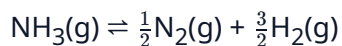
[Step-by-step solution ► prepwiser.in/questions/mcionDjjpC](https://www.prepwiser.in/questions/mcionDjjpC)

Q39 JEE Main 2020 · 6 Sep · Shift 2

The value of K_C is 64 at 800 K for the reaction



The value of K_C for the following reaction is :



(A) 8

(B) $\frac{1}{8}$

(C) $\frac{1}{4}$

(D) $\frac{1}{64}$

[Step-by-step solution ► prepwisser.in/questions/rbxm55W957](https://www.prepwisser.in/questions/rbxm55W957)

Q40 JEE Main 2020 · 6 Sep · Shift 1

The variation of equilibrium constant with temperature is given below :

Temperature Equilibrium Constant

$$T_1 = 25^\circ\text{C} \quad K_1 = 10$$

$$T_2 = 100^\circ\text{C} \quad K_2 = 100$$

The values of ΔH° , ΔG° at

T_1 and ΔG° at T_2 (in kJ mol^{-1}) respectively, are close to :

[Use $R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$]

(A) 28.4, -5.71 and -14.29

(B) 0.64, -7.14 and -5.71

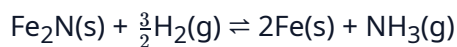
(C) 28.4, -7.14 and -5.71

(D) 0.64, -5.71 and -14.29

[Step-by-step solution ► prepwisser.in/questions/mAjrfmI3dj](https://www.prepwisser.in/questions/mAjrfmI3dj)

Q41 JEE Main 2020 · 6 Sep · Shift 1

For the reaction



(A) $K_C = K_p(\text{RT})^{1/2}$

(B) $K_C = K_p(\text{RT})^{-1/2}$

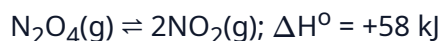
(C) $K_C = K_p(\text{RT})$

(D) $K_C = K_p(\text{RT})^{3/2}$

[Step-by-step solution ► prepwisser.in/questions/fXIfus_YoW](https://www.prepwisser.in/questions/fXIfus_YoW)

Q42 JEE Main 2020 · 5 Sep · Shift 1

Consider the following reaction:



For each of the following cases (a, b), the direction in which the equilibrium shifts is :

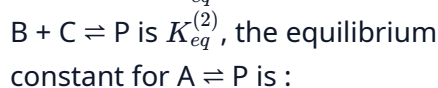
- (a) Temperature is decreased.
(b) Pressure is increased by adding N_2 at constant T.

- (A) (a) towards reactant, (b) towards product
(B) (a) towards reactant, (b) no change
(C) (a) towards product, (b) towards reactant
(D) (a) towards product, (b) no change

[Step-by-step solution ► prepwisser.in/questions/dwrPpdsMly](https://www.prepwisser.in/questions/dwrPpdsMly)

Q43 JEE Main 2020 · 4 Sep · Shift 2

If the equilibrium constant for



- (A) $\frac{K_{eq}^{(1)}}{K_{eq}^{(2)}}$
(B) $K_{eq}^{(1)} + K_{eq}^{(2)}$
(C) $K_{eq}^{(2)} - K_{eq}^{(1)}$
(D) $K_{eq}^{(1)} K_{eq}^{(2)}$

[Step-by-step solution ► prepwisser.in/questions/qCFoktJ_ph](https://www.prepwisser.in/questions/qCFoktJ_ph)

Q44 JEE Main 2020 · 2 Sep · Shift 1

An open beaker of water in equilibrium with water vapour is in a sealed container. When a few grams of glucose are added to the beaker of water, the rate at which water molecules :

- (A) leaves the solution increases
(B) leaves the vapour increases
(C) leaves the vapour decreases
(D) leaves the solution decreases

[Step-by-step solution ► prepwisser.in/questions/uFu5_t3qSZ](https://www.prepwisser.in/questions/uFu5_t3qSZ)

Le Chatelier's Principle · 8 PYQs

Q45 JEE Main 2025 · 3 Apr · Shift 1

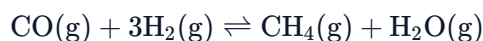
In the following system, $\text{PCl}_5(\text{g}) \rightleftharpoons \text{PCl}_3(\text{g}) + \text{Cl}_2(\text{g})$ at equilibrium, upon addition of xenon gas at constant T & p, the concentration of

- (A) PCl_5 , PCl_3 & Cl_2 remain constant
(B) PCl_3 will increase
(C) Cl_2 will decrease
(D) PCl_5 will increase

[Step-by-step solution ► prepwisser.in/questions/NwPNU83MTC](https://www.prepwisser.in/questions/NwPNU83MTC)

Q46 JEE Main 2025 · 29 Jan · Shift 2

Consider the equilibrium



If the pressure applied over the system increases by two fold at constant temperature then

- (A) Concentration of reactants and products increases.
- (B) Equilibrium will shift in forward direction.
- (C) Equilibrium constant increases since concentration of products increases.
- (D) Equilibrium constant remains unchanged as concentration of reactants and products remain same.

Choose the **correct** answer from the options given below :

- (A) (A) and (B) only
- (B) (A), (B) and (D) only
- (C) (B) and (C) only
- (D) (A), (B) and (C) only

[Step-by-step solution ► prepwisser.in/questions/t_Ku6u9ruL](https://www.prepwisser.in/questions/t_Ku6u9ruL)

Q47 JEE Main 2024 · 8 Apr · Shift 2

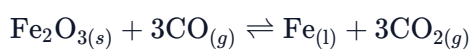
The equilibrium $\text{Cr}_2\text{O}_7^{2-} \rightleftharpoons 2\text{CrO}_4^{2-}$ is shifted to the right in :

- (A) a weakly acidic medium
- (B) a basic medium
- (C) a neutral medium
- (D) an acidic medium

[Step-by-step solution ► prepwisser.in/questions/mUJ3SMqKAp](https://www.prepwisser.in/questions/mUJ3SMqKAp)

Q48 JEE Main 2024 · 5 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.

- (A) Addition of CO_2
- (B) Removal of CO
- (C) Addition of Fe_2O_3
- (D) Removal of CO_2

[Step-by-step solution ► prepwisser.in/questions/IJD7lx9v_t](https://www.prepwisser.in/questions/IJD7lx9v_t)

Q49 JEE Main 2023 · 10 Apr · Shift 1

The number of correct statement/s involving equilibria in physical processes from the following is _____

- (A) Equilibrium is possible only in a closed system at a given temperature.
- (B) Both the opposing processes occur at the same rate.
- (C) When equilibrium is attained at a given temperature, the value of all its parameters became equal.
- (D) For dissolution of solids in liquids, the solubility is constant at a given temperature.

Numerical answer: enter the value.

[Step-by-step solution ► prepwisser.in/questions/pLop_cNpw](https://www.prepwisser.in/questions/pLop_cNpw)

Q50 JEE Main 2023 · 1 Feb · Shift 2

The effect of addition of helium gas to the following reaction in equilibrium state, is :



- (A) the equilibrium will shift in the forward direction and more of Cl_2 and PCl_3 gases will be produced.
(B) addition of helium will not affect the equilibrium.
(C) helium will deactivate PCl_5 and reaction will stop.
(D) the equilibrium will go backward due to suppression of dissociation of PCl_5 .

[Step-by-step solution ► prepwiser.in/questions/1ijeg-F_ZU](https://www.prepwiser.in/questions/1ijeg-F_ZU)

Q51 JEE Main 2023 · 30 Jan · Shift 2

Consider the following equation:



The number of factors which will increase the yield of SO_3 at equilibrium from the following is _____.

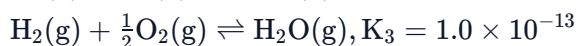
- A. Increasing temperature
B. Increasing pressure
C. Adding more SO_2
D. Adding more O_2
E. Addition of catalyst

Numerical answer: enter the value.

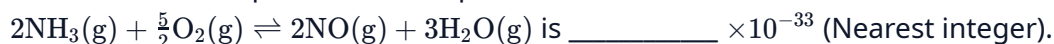
[Step-by-step solution ► prepwiser.in/questions/BqnWKrzt3w](https://www.prepwiser.in/questions/BqnWKrzt3w)

Q52 JEE Main 2023 · 29 Jan · Shift 2

At 298 K



Based on above equilibria, then equilibrium constant of the reaction,



Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/UM8vwOJmNC](https://www.prepwiser.in/questions/UM8vwOJmNC)

Answer key: Chemical Equilibrium

Answers follow NTA's final answer keys. Typing errors are possible, so check doubtful answers against the official key. Spotted a mistake? [prepwiser.in/feedback](https://www.prepwiser.in/feedback) · Terms: [prepwiser.in/terms](https://www.prepwiser.in/terms)

Numbers match the question numbers above. For full working, open the solution link under each question.

1	163	2	855	3	A	4	962	5	C	6	D	7	B	8	D
9	C	10	D	11	B	12	B	13	B	14	417	15	2	16	44
17	3	18	B	19	49	20	1	21	2	22	6	23	2	24	C
25	29	26	747	27	3	28	0	29	16	30	1400	31	1	32	2
33	172	34	2	35	354	36	20	37	5	38	1380	39	B	40	A
41	A	42	B	43	D	44	D	45	B	46	A	47	B	48	C
49	3	50	A, B	51	3	52	4								

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