

1-6-2024

Performa-QP-I



DOON UNIVERSITY, DEHRADUN
Mid Semester Examination, 2nd Semester, 2024
Academic Year 2023-24 (Odd/Even Semester)
School of Physical sciences Department of Chemistry
Programme Name: B.Sc. (Hons.)
Course Code with Title: CYC-153 (Chemical thermodynamics and its applications)

Time Allowed 3.00 Hours/2.00 Hours

Maximum Marks: 30

Note: All questions are compulsory.

SECTION: A

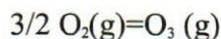
(Very Short Answer Type Questions) (10×1=10)

1. Define Chemical equilibrium.
2. What is the relation between K_p and K_c ?
3. What is the thermodynamic relation for chemical affinity?
4. Write down the formulae of pressure dependence of K_p .
5. What is the effect of change in pressure in chemical equilibrium?
6. Define Henry's Law.
7. What is the formula of Molality?
8. Define Fugacity
9. What do you mean by degree of advancement?
10. Define Chemical potential.

SECTION: B

(Short Answer Type Questions) (5×2=10)

1. Calculate K_p for the reaction



At 298 K. ΔG for the reaction is 163.43kJmol^{-1} . ($R=8.314 \text{JK}^{-1}\text{mol}^{-1}$)

2. Calculate K_c for the reaction $2\text{SO}_3(\text{g}) = 2\text{SO}_2(\text{g}) + \text{O}_2(\text{g})$ for which $K_p = 3.5 \times 10^{-23}$ at 27°C .
3. Derive the work function with chemical affinity.
4. Explain the coupling of exoergic and endoergic reactions.
5. What is Rault's Law?

SECTION: C

(Long Answer Type Questions) (2×5=10)

1. a) Explain the Le Chatalier Principle.
b) What is the equilibrium constant for reactions involving real gases?
2. Discuss the Colligative properties in detail.