

Unit 2 - Week 0

Course outline

How does an NPTEL online course work?

Week 0

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Assignment 0 solutions

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Assignment 0

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-01-27, 23:59 IST.

1) Which of the following is an extensive thermodynamic property? 1 point

- temperature
 pressure
 molar volume
 Gibbs free energy

No, the answer is incorrect.
Score: 0

Accepted Answers:
Gibbs free energy

2) According to second law of thermodynamics, the total entropy change for a reversible process is; 1 point

- negative
 positive
 can be positive or negative
 zero

No, the answer is incorrect.
Score: 0

Accepted Answers:
zero

3) The standards enthalpy change (ΔH°) and the standard entropy change (ΔS°) associated with reaction $\text{CuO (s)} + \text{H}_2 \text{(g)} = \text{Cu (s)} + \text{H}_2\text{O (l)}$ at 500 K are -90 kJ/mol and $50 \text{ JK}^{-1}\text{mol}^{-1}$ respectively. The value of standard free energy change (ΔG°) in kJ/mol for the given reaction at 500 K is; 1 point

- $- (60 \text{ to } 72)$
 $- (34 \text{ to } 45)$
 $- (110 \text{ to } 120)$
 $- (150 \text{ to } 165)$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $- (110 \text{ to } 120)$

4) The equilibrium constant (K_c) for the reaction $\text{FeO (s)} + \text{C (s)} = \text{Fe (s)} + \text{CO (g)}$ at 1500 K is 5.5×10^8 . The standard entropy change (ΔS°) associated with the reaction at 1500 K is 200.5 J/K/mol . The value of standard enthalpy change (ΔH°) in kJ/mol for the given reaction at 1500 K is; 1 point

- (25.8 to 33.8)
 (42.5 to 55.5)
 (85.4 to 93.8)
 (112.8 to 120.6)

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $(42.5 \text{ to } 55.5)$

5) For an ideal binary solution of A and B, the composition (mole fraction) at which the entropy of mixing is maximum at temperature and pressure of 300 K and 1 atm respectively; 1 point

- $X_A = 0.5, X_B = 0.5$
 $X_A = 2, X_B = 0$
 $X_A = 1, X_B = 0.5$
 $X_A = 0.5, X_B = 2$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $X_A = 0.5, X_B = 0.5$

6) In a binary system, the maximum number of phases that can co-exist in equilibrium is; 1 point

- 1
 2
 3
 4

No, the answer is incorrect.
Score: 0

Accepted Answers:
4

7) Consider that a piece of iron is immersed in an electrolyte of pH 10. The value of hydroxyl ion (OH^-) concentration (M) in the solution is; 1 point

- 10^{-10}
 10^{10}
 10^{-4}
 10^4

No, the answer is incorrect.
Score: 0

Accepted Answers:
 10^{-4}

8) How much charge (in Coulomb) is required to reduce 1 mole of Al^{3+} ion to Al? (Given $F = 96500 \text{ Coulomb}$) 1 point

- 280000
 289500
 96500
 193000

No, the answer is incorrect.
Score: 0

Accepted Answers:
289500

9) The activity of Zn^{2+} ion in 0.6 M ZnCl_2 solution is 0.49. The value of activity coefficient of Zn^{2+} ion in the solution is; 1 point

- (0.75 to 0.88)
 (0.25 to 0.32)
 (0.05 to 0.10)
 (2.5 to 3.5)

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $(0.75 \text{ to } 0.88)$

10) The value of the standard free energy change (in J/mol) for the reaction $\text{M}^{2+} + 2\text{e}^- = \text{M}$ is; 1 point

(Given, $\mu_{\text{M}^{2+}}^\circ = -581200 \text{ J/mol}$)

- -290600
 290600
 581200
 -116240

No, the answer is incorrect.
Score: 0

Accepted Answers:
581200