



Unit 2 - Week 1

Course outline

How to access the portal

Week 1

- Lecture 01 : Introduction to the Course
- Lecture 02 : Heterogeneous equilibrium and Free energy Formalism
- Lecture 03 : Concept of Chemical Potential
- Lecture 04: Phase Rule-I
- Lecture 05 : Phase Rule-II and Single Component Equilibria
- Quiz : Week 1 Assignment 1

Week 2

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Week 1 Assignment 1

The due date for submitting this assignment has passed. **Due on 2016-02-09, 23:55 IST.**

Submitted assignment

1) Single Phase Mixture is? 1 point

- Ice water
- Sugar -Water
- Soap bubbles
- Fog

No, the answer is incorrect.

Score: 0

Accepted Answers:

Sugar -Water

2) Martensite is a ----- phase. 1 point

- Meta stable
- Stable
- None
- Unstable

No, the answer is incorrect.

Score: 0

Accepted Answers:

Meta stable

3) Degree of freedom for a three phase, two component system is----- 1 point

- 0
- 3
- 2
- 1

No, the answer is incorrect.

Score: 0

Accepted Answers:

1

4) Gibbs Phase rule, when pressure is constant is given by-. 1 point

- $F=C-P+2$
- $F = C-P+1$
- $F-C = P+3$
- None

Week 12

Week 13

Assignment
Solutions**No, the answer is incorrect.****Score: 0****Accepted Answers:**

$$F = C - P + 1$$

5) Chemical potential of pure component is denoted by-

1 point

- μ_A^α
- μ_A^β
- μ_A
- None

No, the answer is incorrect.**Score: 0****Accepted Answers:***None*

6) Cu -Ni forms----- type phase diagram.

1 point

- Isomorphous
- Eutectic
- Monotectic
- Peritectic

No, the answer is incorrect.**Score: 0****Accepted Answers:***Isomorphous*7) The equilibrium condition for two phase mixture of solid phase α and liquid phase L in a binary A-B system is given by, where μ 's are chemical potentials.**1 point**

- $\mu_A^\alpha = \mu_A^L$
- $\mu_A^\alpha = \mu_B^\alpha$
- $\mu_A^\alpha = \mu_A^\beta$
- None

No, the answer is incorrect.**Score: 0****Accepted Answers:**

$$\mu_A^\alpha = \mu_A^L$$

8) At melting temperature which of the following is true?

1 point

- $G^L = G^S$
- $G^S > G^L$
- $G^S \ll G^L$
- None

No, the answer is incorrect.**Score: 0****Accepted Answers:**

$$G^L = G^S$$

9) On cooling when a two-phase liquid plus solid transforms to a solid phase the transformation **1 point** is -----in nature.

- Eutectic
- Peritectic
- Peritectoid
- Eutectoid

No, the answer is incorrect.

Score: 0

Accepted Answers:

Peritectic

10) The boundary line between (liquid+solid) and (solid) regions must be part of **1 point**

- Solvus
- Solidus
- Liquidus
- Tie-line

No, the answer is incorrect.

Score: 0

Accepted Answers:

Solidus

11) KCl in H₂O at the equilibrium pressure, degree of freedom will be----? **1 point**

- 3
- 4
- 2
- 0

No, the answer is incorrect.

Score: 0

Accepted Answers:

2

12) K⁺Cl⁻ and Na⁺Cl⁻ in H₂O at the equilibrium pressure, degree of freedom will be----? **1 point**

- 2
- 3
- 1
- 4

No, the answer is incorrect.

Score: 0

Accepted Answers:

3

13) The entropy _____ in an irreversible cyclic process. **1 point**

- remain constant
- increase
- decrease
- not change

No, the answer is incorrect.

Score: 0

Accepted Answers:

increase

14) Which statement is incorrect? **1 point**

- At constant pressure, $H = E + P V$

- The thermodynamic symbol for entropy is S
- Gibbs free energy is a state function
- For an endothermic process, H is negative.

No, the answer is incorrect.

Score: 0

Accepted Answers:

For an endothermic process, H is negative.

15 Which one of the following correctly indicates the relationship between the entropy of a system and the number of different arrangements, w, in the system? **1 point**

- $s = kw$
- $s = k \ln w$
- $s = k/w$
- $s = w/k$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$s = k \ln w$

16 From the following list, identify the properties which are equal in both vapour and liquid phases at equilibrium. **1 point**

A. Temperature B. Density C. Chemical Potential D. Enthalpy

- A and B
- A and C
- C and D
- B and D

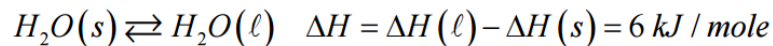
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Score: 0

Accepted Answers:

A and C

17 What is the entropy change for ice to melt? **1 point**



- 2.2 j/mol.k
- 22 j/mol.k
- 0.22 j/mol.k
- 22 j/mol

No, the answer is incorrect.

Score: 0

Accepted Answers:

22 j/mol.k

18 What is the effect on the shape of the free-energy curve for a solution if its interaction parameter is positive **1 point**

- Produces a curve which has one minimum
- Produces a curve with no minimum and one maximum
- Produces a curve which contains a maximum at low T
- Produces a curve which contains a maximum at high T Answer

No, the answer is incorrect.

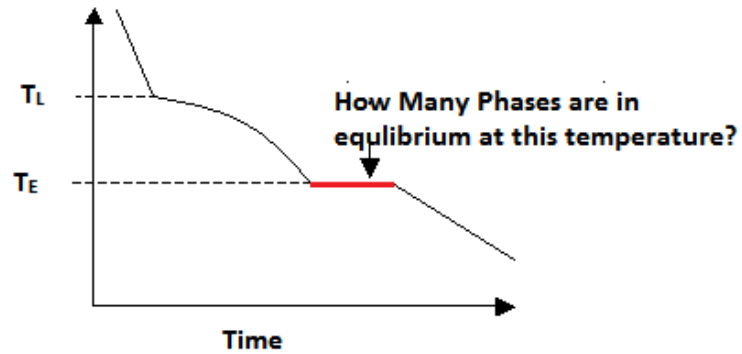
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Accepted Answers:

Produces a curve which contains a maximum at high T Answer

19 Cooling curve for a binary system:

1 point



- 4 phases
- 2 phases
- 3 phases
- 1 phase

No, the answer is incorrect.

Score: 0

Accepted Answers:

3 phases

20 What is a hypoeutectic alloy?

1 point

- An alloy which has a solute content lower than that of the eutectic
- An alloy which has solute content greater than that of the eutectic.
- An alloy whose solute content is such that it contains no eutectic.
- An alloy whose final microstructure is wholly eutectic.

No, the answer is incorrect.

Score: 0

Accepted Answers:

An alloy which has a solute content lower than that of the eutectic

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