Course outline

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- 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

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Courses » Phase Diagrams in Materials Science and Engineering

Unit 2 - Week 1

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

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   Sugar -Water

2) Martensite is a --------- phase.
   - 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------.
   - 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-.
   - $F=C-P+2$
   - $F = C-P+1$
   - $F-C = P+3$
   - None

No, the answer is incorrect.
Score: 0
Accepted Answers:
None
5) Chemical potential of pure component is denoted by-

- $\mu_A^{\alpha}$
- $\mu_A^{\beta}$
- $\mu_A^p$
- $\mu_A$
- None

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

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

- 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 $\alpha$ and liquid phase $L$ in a binary A-B system is given by, where $\mu$'s are chemical potentials.

- $\mu_A^{\alpha} = \mu_A^l$
- $\mu_A^{\alpha} = \mu_B^s$
- $\mu_A^{\alpha} = \mu_A^p$
- None

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\mu_A^s = \mu_A^l$

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

- $G^l = G^s$
- $G^s > G^l$
- $G^s << G^l$
- 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 is \text{----------------} in nature.

- Eutectic
- Peritectic
- Peritectoid
- Eutectoid

\textbf{No, the answer is incorrect.}
\textbf{Score: 0}
\textbf{Accepted Answers:}
- \textit{Peritectic}

10) The boundary line between (liquid+solid) and (solid) regions must be part of \text{---}

- Solvus
- Solidus
- Liquidus
- Tie-line

\textbf{No, the answer is incorrect.}
\textbf{Score: 0}
\textbf{Accepted Answers:}
- \textit{Solidus}

11) KCl in H$_2$O at the equilibrium pressure, degree of freedom will be \text{---}?

- 3
- 4
- 2
- 0

\textbf{No, the answer is incorrect.}
\textbf{Score: 0}
\textbf{Accepted Answers:}
- 2

12) K$^+$Cl$^-$ and Na$^+$Cl$^-$ in H$_2$O at the equilibrium pressure, degree of freedom will be \text{---}?

- 2
- 3
- 1
- 4

\textbf{No, the answer is incorrect.}
\textbf{Score: 0}
\textbf{Accepted Answers:}
- 3

13) The entropy \text{___________} in an irreversible cyclic process.

- \text{remain constant}
- \text{increase}
- \text{decrease}
- \text{not change}

\textbf{No, the answer is incorrect.}
\textbf{Score: 0}
\textbf{Accepted Answers:}
- \textit{increase}

14) Which statement is incorrect?

- At constant pressure, $H = E + PV$
24/07/2018

Phase Diagrams in Materials Science and Engineering - - Unit 2 - Week 1

- 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?  

- s = kw  
- s = k lnw  
- s = k/w  
- s = w/k  

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
s = k lnw

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

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

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

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
A and C

17 What is the entropy change for ice to melt?  

吸入sO(s) $\rightleftharpoons$ H2O(l)  
$\Delta H = \Delta H(l) - \Delta H(s) = 6 \text{kJ/mol}$

- 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?  

- 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  

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
Produces a curve which contains a maximum at high T
19. Cooling curve for a binary system:

- 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?

- 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