Week 3 Assignment 3

The due date for submitting this assignment has passed. Due on 2016-02-14, 23:55 IST.

Submitted assignment

1.1) What are the phases present at 1120°C for 15 atomic % Ni?

- Solid
- Liquid
- Both A and B
- Gas

No, the answer is incorrect.
Score: 0

Accepted Answers: Both A and B

2) What is the composition of the solid phase at 1300°C for 60 atomic % Ni?

- 23
- 35
3) Why Ni is completely soluble in copper whereas Al has only a limited solubility in copper?  

- Nickel & Copper have face centered cubic structure while Aluminium has a body centered cubic structure
- Ni and Cu have nearly same lattice parameter while Al has a larger lattice parameter
- Ni and Cu have same surface energy while Al has a lesser surface energy
- All of the above

No, the answer is incorrect.  
Score: 0(956,393)  
Accepted Answers:  
68

4) Which of the following is true for the following phase diagram?  

- complete liquid but zero solid solubility
- complete liquid and limited solid solubility
- A is completely soluble but not B
- B is completely soluble but not A

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
complete liquid but zero solid solubility

5) Phase diagram can be used to determine -----  

- Compositions of the phases
- The relative fractions of the phases
- The phases that are present
- All of the above

No, the answer is incorrect.  
Score: 0  
Accepted Answers:
6) What does the solvus line indicate?

- separates one solid solution from a mixture of liquid solutions
- shows limit of solubility
- separates one liquid solution from a mixture of solid solutions
- None

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

- shows limit of solubility

7) The melting point of the eutectic alloy is ------ than that of the components.

- higher
- lower
- same
- can't say

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

- lower

8) Two metals A (melting point 800°C) and B (melting point 600°C) form a binary isomorphous system. An alloy having 35% B has 75% solid and rest liquid whereas an alloy having 55%B has 25% solid at 700°C. Estimate the composition of solidus at 700°C.

- 15% B
- 25% B
- 35% B
- 45% B

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

- 25% B

9) Two alloys belonging to a binary system have the following microstructures. One having 25% B consists of 50% α & 50% eutectic and the other having 75%B has 50% β & 50% eutectic. Microstructrual examination shows that eutectic is made of 50% α & 50% β. Estimate the composition of eutectic.

- 33% B
- 67% B
- 75% B
- 50% B

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

- 50% B

10) A binary alloy having 28 wt % Cu & balance Ag solidifies at 779°C. The solid consists of two phases α & β. Phase α has 8% Cu whereas phase β has 8% Ag at 779°C. At room temperature these are pure Ag & Cu respectively. What is the amount of α in the above alloy at 779°C?

- 43% Cu
- 51% Cu
- 76% Cu
- 88% Cu

https://onlinecourses.nptel.ac.in/noc16_mmm05/unit?unit=18&assessment=34
11) In Question 10, what is the amount of $a$ at room temperature?

- 69% Cu
- 50% Cu
- 75% Cu
- 72% Cu

No, the answer is incorrect.
Score: 0
Accepted Answers:
- 76% Cu

12) Which of the following is/are a characteristic of an intermetallic compound?

- Precise chemical compositions
- When using the lever rule, they can be treated like any other phase.
- Is a mixture of two metals over a range of chemical compositions
- None

No, the answer is incorrect.
Score: 0
Accepted Answers:
- Precise chemical compositions
- When using the lever rule, they can be treated like any other phase.

13) Why Pb-Sn materials are widely used as solders?

- They have good electrical and thermal conductivity
- They form a binary isomorphous which decreases it melting temperature
- Both 1 and 2
- They form a eutectic system which decreases it melting temperature

No, the answer is incorrect.
Score: 0
Accepted Answers:
- They form a eutectic system which decreases it melting temperature

14) Which of the following depicts a microstructure for an alloy with less than eutectic composition?

- [Image of microstructure]
None

No, the answer is incorrect.
Score: 0

Accepted Answers:
Which of the following depicts a microstructure for an alloy with eutectic composition?

None

No, the answer is incorrect.

Score: 0

Accepted Answers:
16. Which of the following depicts a microstructure for an alloy with more than eutectic composition?
No, the answer is incorrect.
Score: 0

Accepted Answers:

1.17) The microstructure of a Cu-Ag alloy at 779ºC consists of primary alpha; and eutectic microstructures. If the mass fractions of these two micro-constituents are 0.73 and 0.27, respectively, determine the alloy
1.18) Consider 1 kg of brass with a composition of 35 wt.% Zn-65 wt.% Cu. This phase diagram is shown below. Upon cooling, at which temperature does the first solid appear?

- 20.9 wt%
- 25.3 wt%
- 21.9 wt%
- 26.1 wt%

No, the answer is incorrect.
Score: 0
Accepted Answers:
25.3 wt%
19) Refer to Question 18. At which temperature will the alloy completely solidify?

- 990°C
- 930°C
- 890°C
- 900°C
- 910°C
- 920°C

No, the answer is incorrect.
Score: 0
Accepted Answers: 930°C

1 point

20) Refer to Question 18. Above what temperature will the microstructure be completely in the solid α phase?

- 290°C
- 270°C
- 250°C
- 200°C

No, the answer is incorrect.
Score: 0
Accepted Answers: 200°C

No, the answer is incorrect.
Score: 0
Accepted Answers: 900°C

1 point