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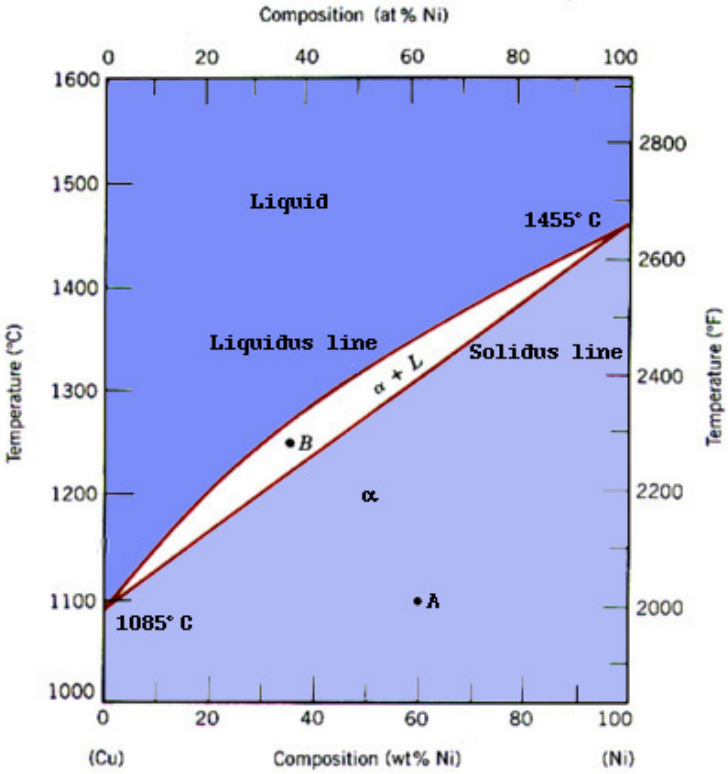
Unit 4 - Week 3

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 1120C for 15 atomic % Ni? ***1 point***



- 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 1300C for 60 atomic % Ni ? ***1 point***

- 23
- 35

Week 10
Week 11
Week 12
Week 13
Assignment Solutions

68
95

No, the answer is incorrect.
Score: 0

Accepted Answers:
68

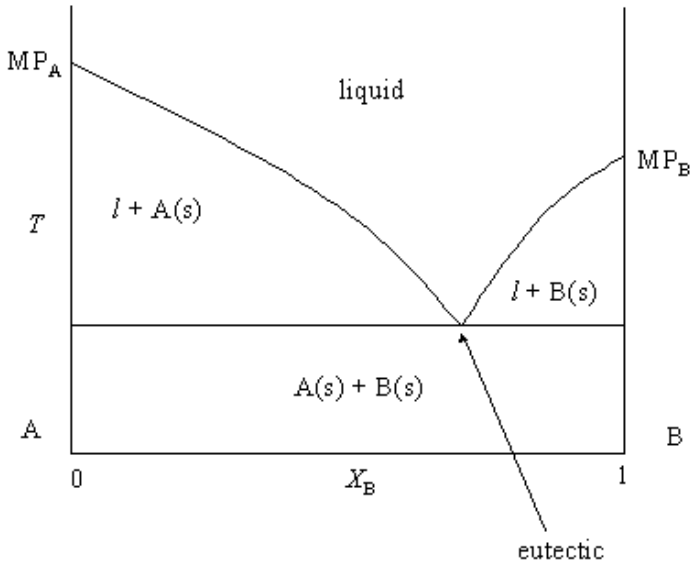
3) Why Ni is completely soluble in copper whereas Al has only a limited solubility in copper? ***1 point***

Nickel & Copper have face cantered 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

Accepted Answers:
Ni and Cu have nearly same lattice parameter while Al has a larger lattice parameter

4) Which of the following is true for the following phase diagram? ***1 point***



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 ----- ***1 point***

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:

All of the above

6) What does the solvus line indicate? ***1 point***

- 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. ***1 point***

- higher
- lower
- same
- can't say

No, the answer is incorrect.
Score: 0

Accepted Answers:
lower

8) Two metals A (melting point 800C) and B (melting point 600C) 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 700C. Estimate the composition of solidus at 700C. ***1 point***

- 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. Microstructrural examination shows that eutectic is made of 50% α & 50% β. Estimate the composition of eutectic. ***1 point***

- 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^{o}C. The solid consists of two phases a & b. Phase a has 8% Cu whereas phase b has 8% Ag at 779^{o}C. At room temperature these are pure Ag & Cu respectively. What is the amount of a in the above alloy at 779^{o}C ***1 point***

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

No, the answer is incorrect.
Score: 0

Accepted Answers:
76% Cu

11) In Question 10, what is the amount of a at room temperature **1 point**

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

No, the answer is incorrect.
Score: 0

Accepted Answers:
72% Cu

12) Which of the following is/are a characteristic of an intermetallic compound? **1 point**

- 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.

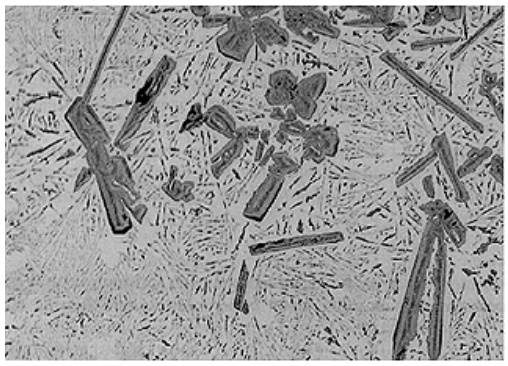
13) Why Pb-Sn materials are widely used as solders? **1 point**

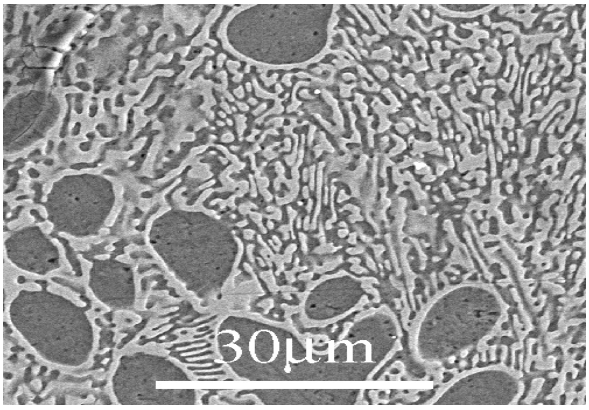
- They have good electrical and thermal conductivity
- They form a binary isomorphous which decreases it melting temperature
- Both 1 and2
- They form a eutectic system which decreases it melting temperature

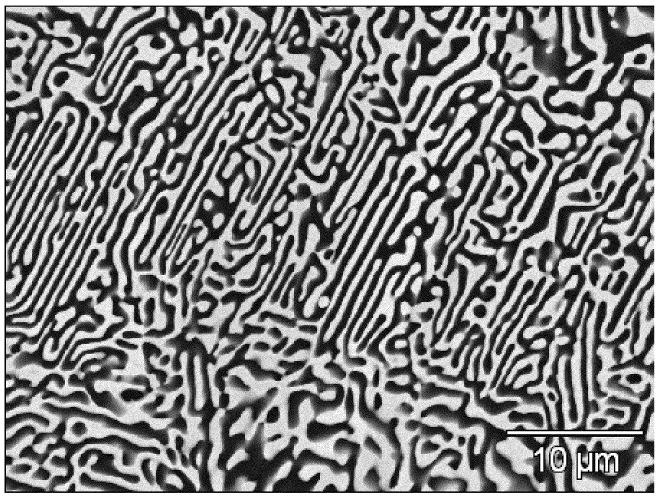
No, the answer is incorrect.
Score: 0

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? **1 point**



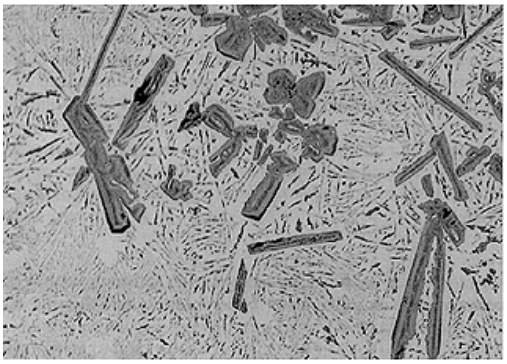


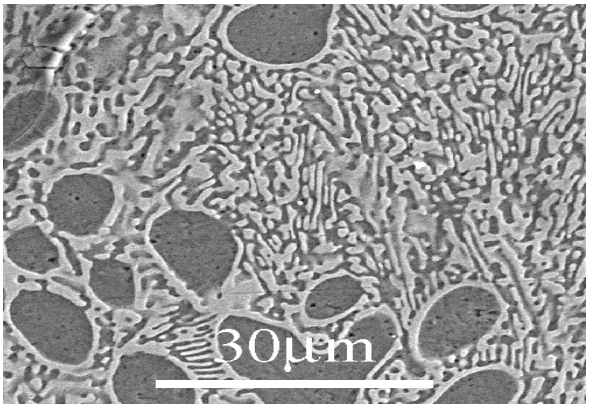


None

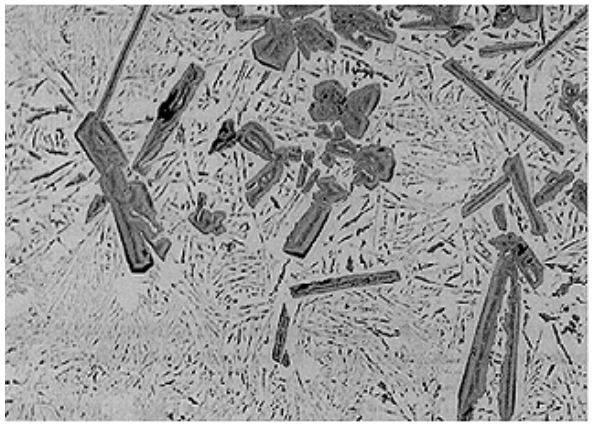
No, the answer is incorrect.
Score: 0

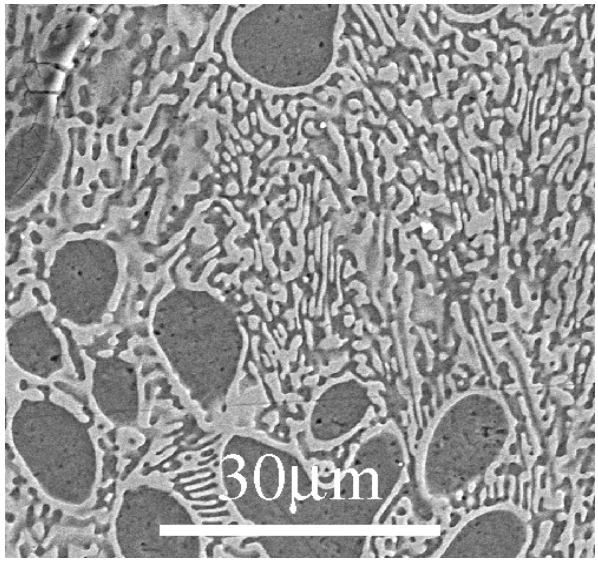
Accepted Answers:

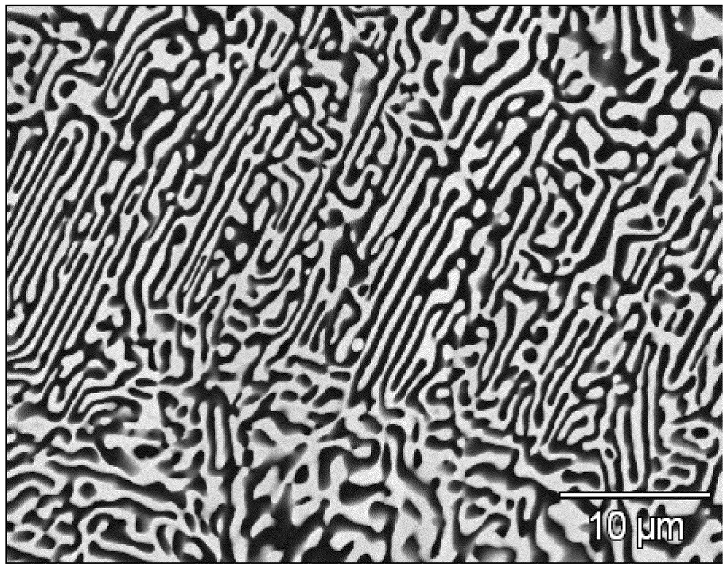




15) Which of the following depicts a microstructure for an alloy with eutectic composition? *1 point*



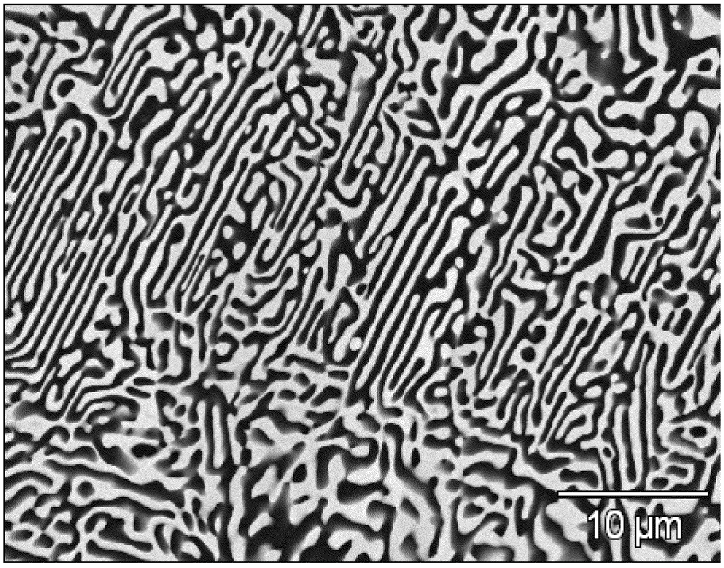




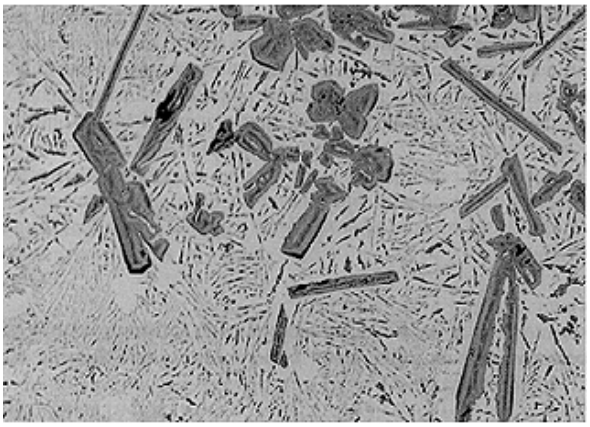
None

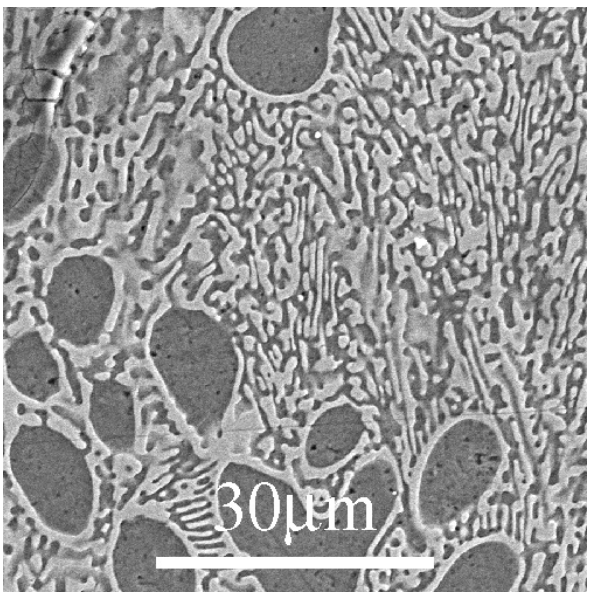
No, the answer is incorrect.
Score: 0

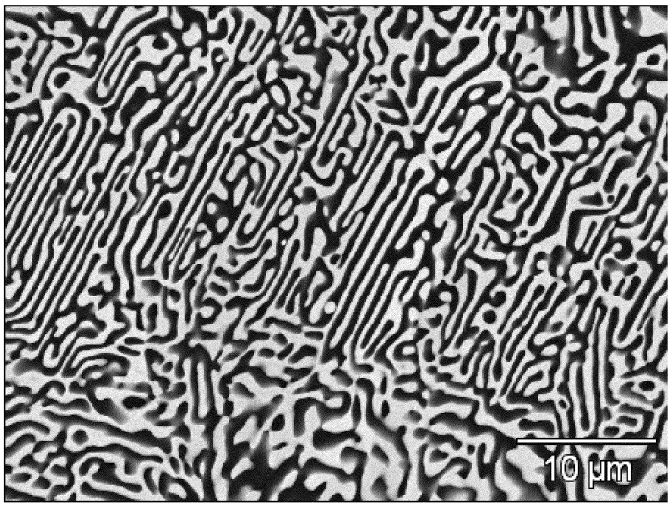
Accepted Answers:



16) Which of the following depicts a microstructure for an alloy with more than eutectic composition? ***1 point***



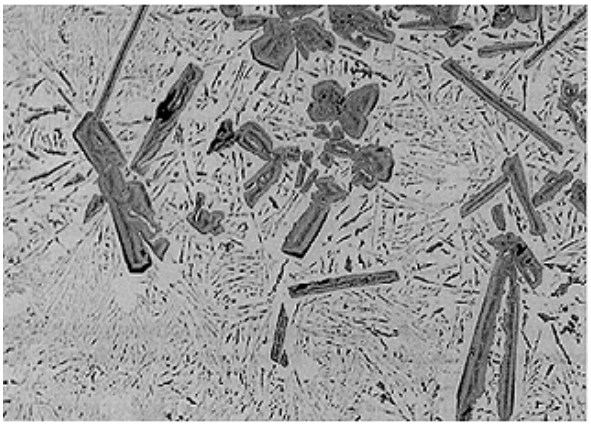


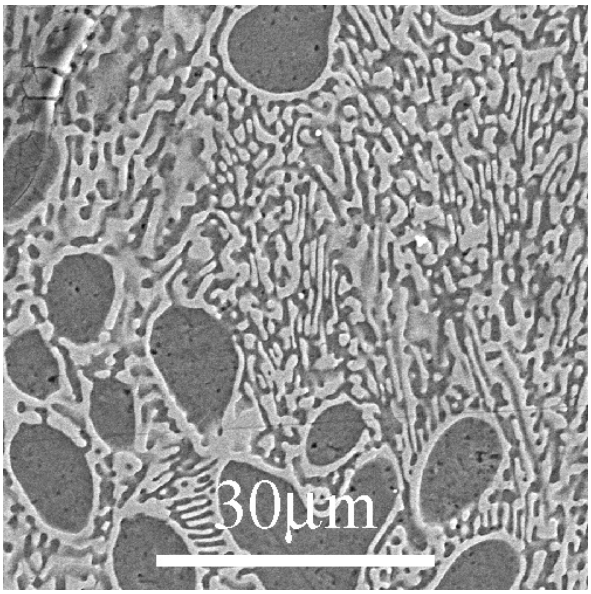


None

No, the answer is incorrect.
Score: 0

Accepted Answers:

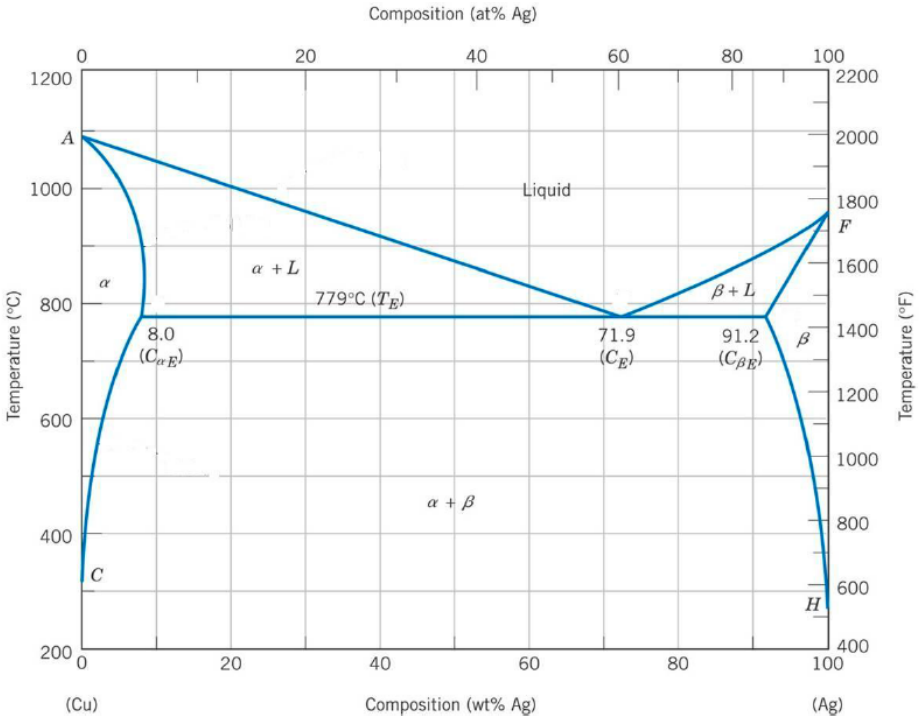




1.17)The microstructure of a Cu-Ag alloy at 779ºC consists of primary alpha; and eutectic microstructures. If the mass fractions of these two micro-constituents are 0.73 and 0.27, respectively, determine the alloy

1 point

composition.

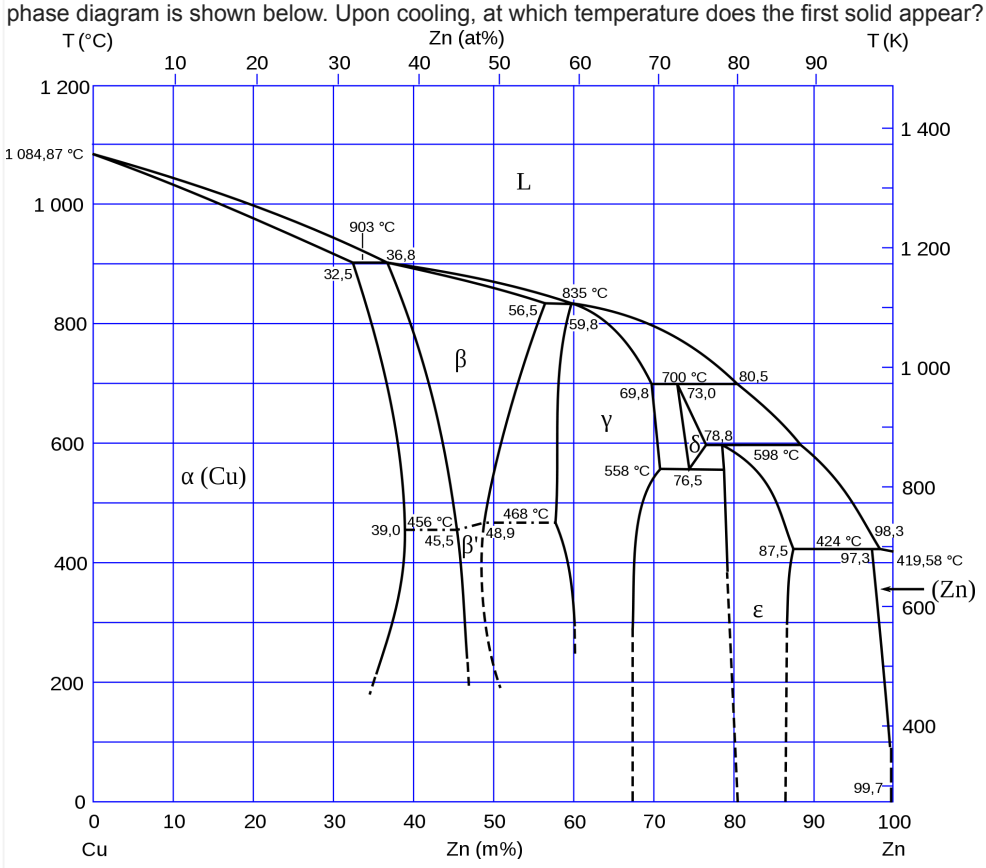


- 20.9 wt%
- 25.3 wt%
- 21.9 wt%
- 26.1 wt%

No, the answer is incorrect.
Score: 0

Accepted Answers:
25.3 wt%

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? ***1 point***



- 880C

- 990C
- 930C
- 830C

No, the answer is incorrect.
Score: 0

Accepted Answers:
930C

19) Refer to Question 18. At which temperature will the alloy completely solidify? ***1 point***

- 890C
- 900C
- 910C
- 920C

No, the answer is incorrect.
Score: 0

Accepted Answers:
900C

20) ***1 point***

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

- 290C
- 270C
- 250C
- 200C

No, the answer is incorrect.
Score: 0

Accepted Answers:
200C

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