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NPTEL

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Unit 6 - Week-5

Assignment-5

The due date for submitting this assignment has passed. Due on 2018-03-18, 23:59 IST.
As per our records you have not submitted this assignment.

1) Q1 During homogeneous solidification of a pure metal from its molten state, very low nucleation rate and very high growth rate will result into the microstructure consisting of *1 point*

- (a) Very coarse grains
- (b) Very fine grains
- (c) Mixture of fine and coarse grains
- (d) Different for different metal

No, the answer is incorrect.
Score: 0

Accepted Answers:
(a) Very coarse grains

2) Q2 During the homogeneous nucleation of a pure metal, if the nucleation rate is below the critical nucleation rate *1 point*

- (a) Solidification takes place rapidly
- (b) Solidification depends on the crystal structure of the metal
- (c) Liquid remain as supercooled liquid
- (d) None of these

No, the answer is incorrect.
Score: 0

Accepted Answers:
(c) Liquid remain as supercooled liquid

3) Q3 For same critical size of nucleus (r*), which of the following statement is correct for free energy barrier to nucleation and nucleation rate for homogeneous and heterogeneous nucleation? [Assume contact angle $\theta < 180^{\circ}$] *1 point*

- (a) $(\Delta G^*)_{homo} = (\Delta G^*)_{hetero}$ and $I_{homo} = I_{hetero}$ always
- (b) $(\Delta G^*)_{homo} < (\Delta G^*)_{hetero}$ and $I_{homo} > I_{hetero}$
- (c) $(\Delta G^*)_{homo} > (\Delta G^*)_{hetero}$ and $I_{homo} < I_{hetero}$
- (d) $(\Delta G^*)_{homo}$ and I_{homo} can be greater than or less than $(\Delta G^*)_{hetero}$ and I_{hetero}

No, the answer is incorrect.
Score: 0

Accepted Answers:
(c) $(\Delta G^*)_{homo} > (\Delta G^*)_{hetero}$ and $I_{homo} < I_{hetero}$

4) Q4 10 g of gold and 25 g of silver are mixed to form a single- phase ideal solid solution. The mole fraction of gold and silver are: (given that the atomic weight of gold and silver are 196.97 and 107.87 g/mole, respectively). *1 point*

- (a) 0.18 and 0.82, respectively.
- (b) 0.12 and 0.88, respectively.
- (c) 0.10 and 0.90, respectively.
- (d) 0.13 and 0.87, respectively.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(a) 0.18 and 0.82, respectively.

5)  *1 po*




No, the answer is incorrect.
Score: 0

Accepted Answers:

6) Q6 The chemical potential of elements A and B in an ideal solution is given by: *1 point*

- (a) $m_A = -m^0_A + RT \ln X_A$ and $m_B = -m^0_B + RT \ln X_B$.
- (b) $m_A = m^0_A - RT \ln X_A$ and $m_B = m^0_B - RT \ln X_B$.
- (c) $m_A = m^0_A + RT \ln X_A$ and $m_B = m^0_B + RT \ln X_B$.
- (d) $m_A = -m^0_A - RT \ln X_A$ and $m_B = -m^0_B - RT \ln X_B$

No, the answer is incorrect.
Score: 0

Accepted Answers:
(c) $m_A = m^0_A + RT \ln X_A$ and $m_B = m^0_B + RT \ln X_B$.

7)  *1 point*

- (a) No change in the concentration of a and b.
- (b) Accumulation of A atoms at a/b interface.
- (c) Migration of A atom from a to b phase.
- (d) Migration of A atom from b to a phase.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(c) Migration of A atom from a to b phase.

8) Q8 In the plot shown below, the phases stable in the region of **cd** will be: *1 point*

- (a) g
- (b) b
- (c) g+b+L
- (d) a+b

No, the answer is incorrect.
Score: 0

Accepted Answers:
(c) g+b+L

9) *1 point*

No, the answer is incorrect.
Score: 0

Accepted Answers:

10) *1 point*

No, the answer is incorrect.
Score: 0

Accepted Answers:

Previous Page End

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