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Unit 2 - Week-1

Assignment 1

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment. **Due on 2018-08-15, 23:59 IST.**

1) Consider a binary alloy system A-B where 20 g of A and 30 g of B are mixed to form an ideal solid solution. The atomic weight of element A is 63.546 g/mol and element B is 26.98 g/mol. Calculate the mole fraction of A and B : ***1 point***

- 0.220 and 0.779.
- 0.112 and 0.888.
- 0.212 and 0.788.
- 0.434 and 0.566

No, the answer is incorrect.
Score: 0

Accepted Answers:
0.220 and 0.779.

2) For the same A-B alloy(ideal solid solution) calculate the configurational entropy at 500^0 C : ***1 point***

- 6.256 J/K
- 3.342 J/K
- -3.342 J/K
- -6.256 J/K

No, the answer is incorrect.
Score: 0

Accepted Answers:
6.256 J/K

3) For the same A-B alloy (ideal solid solution) calculate the free energy of mixing per ***1 point***

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- -3.166 kJ/mol

No, the answer is incorrect.
Score: 0

Accepted Answers:
-3.39 kJ/mol

4) For the same A-B alloy (ideal solid solution) calculate the chemical potential of A and B at 500^0 C (assume free energies of pure A and B zero) : ***0 points***

- -9.73 kJ/mol and -2.07 kJ/mol.
- -14.52 kJ/mol and -3.12 kJ/mol.
- 9.73 kJ/mol and 2.07 kJ/mol.
- 14.52 kJ/mol and 3.12 kJ/mol.

No, the answer is incorrect.
Score: 0

Accepted Answers:
-9.73 kJ/mol and -2.07 kJ/mol.

5) Consider a system consisting of A and B atoms. Let the total number of atoms be equal to 100. Consider two cases when a. NA = 60, NB = 40 and b. NA = 40, NB = 60. Would the configurational entropy be different in the two cases? ***1 point***

- Yes
- No
- Can't say

No, the answer is incorrect.
Score: 0

Accepted Answers:
No

6) Phase separating systems are those in which interaction parameter (Ω) is: ***1 point***

- $\Omega < 0$
- $\Omega > 0$
- $\Omega = 0$
- equal to number of phases

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\Omega > 0$

7) Phase separation can't be expected when a change in enthalpy of mixing is_____(positive or negative)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) negative

1 point

8) A tangent is drawn to the G versus X curve of a binary alloy system at some composition X0. The points of intersection of this tangent with the G-axis (at compositions X=0 and X=1) gives: *1 point*

- Free energy of mixing of the components at that composition.
- Enthalpy of Mixing of the components at that composition.
- Chemical Potential of the components of that composition.
- Enthalpy of formation of the components at that composition.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Chemical Potential of the components of that composition.

9) Which of the following expressions give the enthalpy of a pure, single phase material? *1 point*

- $\int C_p dT$
- $\int \frac{C_p}{T}\, dT$
- $\frac{dC_p}{dT}$
- $C_p ln(C_p) - 1$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\int C_p dT$

10) Interaction parameter Ω > 0, means that: *1 point*

- A-A, B-B bonds are preferred over A-B bonds.
- A-B bonds are preferred over A-A, B-B bonds.
- There is no preference.

No, the answer is incorrect.
Score: 0

Accepted Answers:
A-A, B-B bonds are preferred over A-B bonds.

11) In Sterling's approximation, the error at N = 50 is nearly: *1 point*

- 0.2%
- 2%
- 10%
- 50%

No, the answer is incorrect.
Score: 0

Accepted Answers:
2%

12) Fe − Fe3C phase diagram is a/an : *1 point*

- equilibrium phase diagram.
- metastable phase diagram.
- Unstable phase diagram.
- None of the above.

No, the answer is incorrect.
Score: 0

Accepted Answers:
metastable phase diagram.

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