Unit 10 - Week 8

Assignment 8

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-10-23, 23:59 IST.

1) The value of Pilling Bedworth Ratio (R) for the formation of Fe_2O_3 oxide is: (Given: atomic weight of Fe=56, atomic weight of oxygen=16, density of Fe=7.86 g/cm^3, density of Fe_2O_3=5.24 g/cm^3) 1 point

- (2.09 to 2.18)
- (4.63 to 4.72)
- (1.38 to 1.46)
- (0.55 to 0.64)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(2.09 to 2.18)

2) Consider that a Cr plate of thickness 4 mm is oxidised to CrO_3 having cross-sectional area 2 cm^2. The value of the volume (cm^3) of oxide layer formed on the surface of Cr is: (Given: density of Cr = 7.14 g/cm^3, atomic weight of Cr = 51.9, atomic weight of oxygen = 16, density of CrO_3 = 4.89 g/cm^3) 1 point

- (2.8 to 3.4)
- (3.9 to 4.6)
- (0.3 to 0.9)
- (1.5 to 2.3)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(1.5 to 2.3)

3) Which of the following statements is comprehensively true for the protective oxide film? 1 point

- dissimilar thermal expansion coefficient of the oxide and the metal
- the oxide should be of evaporative in nature
- low diffusion coefficient of oxygen ion in oxide
- oxide should have low melting and boiling temperature

No, the answer is incorrect.
Score: 0
Accepted Answers:
low diffusion coefficient of oxygen ion in oxide

4) Ni oxidizes to NiO at 1200K having equilibrium constant (K_p) of $3.5x10^4$. Considering unit activity of Ni and NiO, the value of partial pressure of oxygen (atm) on the surface of Ni is: 1 point

- $(4.4 \text{ to } 5.6) \times 10^{-5}$
- $(0.9 \text{ to } 1.5) \times 10^{-10}$
- $(7.8 \text{ to } 8.6) \times 10^{-15}$
- $(2.2 \text{ to } 3.2) \times 10^{-5}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
(7.8 to 8.6) x10^{-15}

5) Consider the oxidation of copper to Cu_2O at 1200 °C. The standard changes in enthalpy and entropy for the formation of Cu_2O are 300 kJ/mol and 200 J/K/mol, respectively. The value of partial pressure of oxygen (atm) is: (consider unit activity of Cu and Cu_2O) 1 point

- (3.44 to 4.50)
- (0.01 to 0.10)
- (1.00 to 1.10)
- (2.21 to 2.30)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(1.00 to 1.10)

6) The weight gain versus time data for oxidation of Ni at an elevated temperature of 600 °C is shown below. 1 point

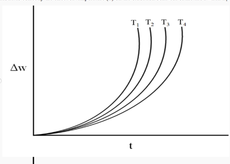
W/A (mg/cm^2)	Time (s)
2.8	5600

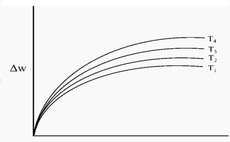
Consider the oxidation kinetics follow parabolic law, the value of W/A (mg/cm^2) after a period of 500 min at the same temperature is:

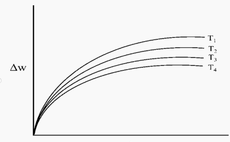
- (6.44 to 6.52)
- (1.32 to 1.40)
- (3.66 to 3.72)
- (0.24 to 1.02)

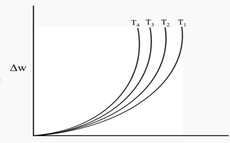
No, the answer is incorrect.
Score: 0
Accepted Answers:
(6.44 to 6.52)

7) Consider that the oxidation of a metal M follows the parabolic oxidation rate law. Which of the following plots (Δw (g/cm^2) vs t (s)) illustrates correctly the effect of temperature (T) on the oxidation behavior of metal M when $T_1>T_2>T_3>T_4$? 1 point

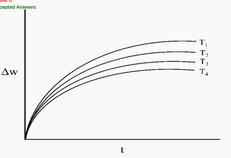




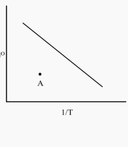




No, the answer is incorrect.
Score: 0
Accepted Answers:



8) The ΔG^o vs 1/T plot for the reaction $M + O_2 = MO_2$ is shown below. The correct relation between actual partial pressure of the oxygen ($p_{O_2}^{actual}$) and equilibrium partial pressure of oxygen ($p_{O_2}(eq,T)$) at point A will be; 1 point



- $p_{O_2}^{actual} < p_{O_2}(eq,T)$
- $p_{O_2}^{actual} > p_{O_2}(eq,T)$
- $p_{O_2}^{actual} = p_{O_2}(eq,T)$
- $p_{O_2}^{actual} \geq p_{O_2}(eq,T)$

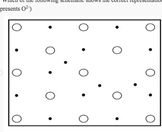
No, the answer is incorrect.
Score: 0
Accepted Answers:
$p_{O_2}^{actual} < p_{O_2}(eq,T)$

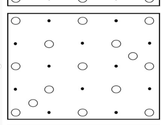
9) Which of the following is true for the p-type metal oxide? 1 point

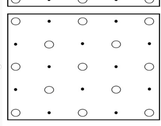
- metal excess metal oxide
- metal deficient metal oxide
- oxygen deficient metal oxide
- all of the above

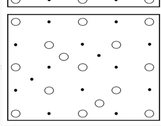
No, the answer is incorrect.
Score: 0
Accepted Answers:
metal deficient metal oxide

10) Which of the following schematic shows the correct representation of the n-type metal oxide (MO)? (where ● represents M^{2+} and O represents O^{2-}) 1 point









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