Unit 4 - Week 2

Assignment 2

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

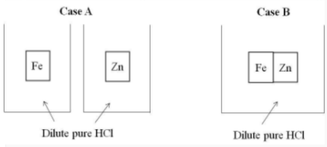
Due on 2020-02-12, 23:59 IST.

1) Consider that you need to produce a nano-porous Ag from Ag-Zn alloy. Which of the following form of corrosion will result in production of nano-porous Ag? *1 point*

- uniform corrosion
- dealloying
- pitting
- intergranular corrosion

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

2) Consider two different cases where iron and zinc are immersed in dilute deaerated HCl solution of 0.1 N concentration at room temperature as shown in figure below. Which of the following statement is true regarding the two different cases? *1 point*



- corrosion rate of Zn is more in case A as compared to case B
- corrosion rate of Fe is more in case B as compared to case A
- corrosion rate of Fe is more in case A as compared to case B
- corrosion rate of Fe and Zn are same in both the cases

No, the answer is incorrect.
Score: 0
Accepted Answers:
corrosion rate of Fe is more in case A as compared to case B

3) Consider that an electrochemical cell made of Fe and Zn electrodes are placed in $FeSO_4$ and $ZnSO_4$ solutions, respectively and separated by a salt bridge. The standard reduction potentials of Fe and Zn are - 0.44 V and - 0.76 V with respect to standard hydrogen electrode, respectively. Considering unit activities of Fe^{2+} and Zn^{2+} ions in their respective electrolytes at room temperature, identify the correct statement. *1 point*

- Zn will act as anode, Fe will be cathode, and E^0 of the cell = 0.32 V
- Zn will act as cathode, Fe will be anode, and E^0 of the cell = - 0.32 V
- Zn will act has anode, Fe will be cathode, and E^0 of the cell = - 1.2 V
- Zn will act has cathode, Fe will be anode, and E^0 of the cell = 1.2 V

No, the answer is incorrect.
Score: 0
Accepted Answers:
Zn will act as anode, Fe will be cathode, and E^0 of the cell = 0.32 V

4) Based on question 3, the value of standard free energy change (in kJ/mol) for the overall cell reaction is; (Given: F = 96500 coulomb) *1 point*

- - (90.5 to 99.4)
- (35.2 to 44.3)
- - (59.5 to 66.5)
- (25.5 to 35.4)

No, the answer is incorrect.
Score: 0
Accepted Answers:
- (59.5 to 66.5)

5) If a current of 0.8 A flows through a metallic wire for 3 hours, then total number of electrons flowing through the wire is; *1 point*

- (2.2 to 3.0) ´10^{22}
- (1.2 to 2.0) ´10^{25}
- (5.0 to 6.2) ´10^{22}
- (0.2 to 1.0) ´10^{19}

No, the answer is incorrect.
Score: 0
Accepted Answers:
(5.0 to 6.2) ´10^{22}

6) For a reversible process, the relation between ΔG (free energy change), $W^{'}$ (electrical work) and ΔE (overall cell potential), is; (where n is number of moles of electrons and F is Faraday constant) *1 point*

- ΔG = $W^{'}$ and $W^{'}$ = - nF ΔE
- ΔG = - $W^{'}$ and $W^{'}$ = nF ΔE
- ΔG = - $W^{'}$ and $W^{'}$ = - nF ΔE
- ΔG = $W^{'}$ and $W^{'}$ = nF ΔE

No, the answer is incorrect.
Score: 0
Accepted Answers:
ΔG = - $W^{'}$ and $W^{'}$ = nF ΔE

7) Consider the cell given as <Sn(s) – $SnCl_2$(s) | HCl (aq) | Ag(s) – AgCl(s)>. The overall cell reaction can be written as; *1 point*

- ½ Sn + AgCl = Ag + ½ $SnCl_2$
- 2Ag + $SnCl_2$ = Sn + 2AgCl
- Sn + 2HCl = $SnCl_2$ + H_2
- Ag + HCl = AgCl + ½ H_2

No, the answer is incorrect.
Score: 0
Accepted Answers:
½ Sn + AgCl = Ag + ½ $SnCl_2$

8) Based on question 7, the value of entropy change (in J/K) for 1 mole of silver deposition at 25 ^{O}C is; (Given : $(\frac{\partial E}{\partial T})_P = -2.6 \times 10^{-4}$ V/K; n =1) *1 point*

- - (55 to 67)
- - (39 to 45)
- - (4 to 11)
- - (22 to 29)

No, the answer is incorrect.
Score: 0
Accepted Answers:
- (22 to 29)

9) Based on question 7, the value of enthalpy change (in kJ/mole) for 1 mole of silver deposition at 25 ^{O}C is; (Given: F = 96500 coulomb, E_{cell}= 0.62 V) *1 point*

- (35.2 to 38.8)
- (102.3 to 103.9)
- - (65.5 to 75.8)
- - (23.4 to 24.9)

No, the answer is incorrect.
Score: 0
Accepted Answers:
- (65.5 to 75.8)

10) Based on question 7, the value of enthalpy of formation of AgCl (in kJ/mole) at 1 atm. and 25 ^{O}C is; (Given $\Delta H_{SnCl_2} = -45500$ J/mol) *1 point*

- (40.5 to 50.5)
- (22.5 to 30.5)
- - (88.2 to 95.5)
- - (110.5 to 120.5)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(40.5 to 50.5)