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Courses » Introduction to Chemical Thermodynamics and Kinetics

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## Unit 11 - Week 9

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### Course outline

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I)  
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Lecture note 09

## Assignment 9

The due date for submitting this assignment has passed.

As per our records you have not submitted this **Due on 2019-04-03, 23:59 IST.**  
assignment.

1) Compute the electrode potential of the following electrode at **1 point**

Pt (s) | Fe<sup>3+</sup> (a=0.05), Fe<sup>2+</sup> (0.01); E<sup>0</sup> = 0.771 V

0.512 V

0.812 V

0.356 V

0.428 V

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

**0.812 V**

2) Calculate the electrode potential of the following: **1 point**

Cl<sup>-</sup> (a<sub>±</sub>=0.95), AgCl (s), Ag; E<sup>0</sup> = 0.2224 V

0.2237 V

0.5574 V

0.1111 V

0.8866 V

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

**0.2237 V**

3) Compute the electrode potential of the following electrode at **1 point**

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 Assignment 9  
Solutions

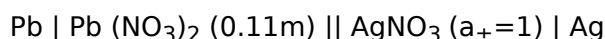
Week 10

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**No, the answer is incorrect.****Score: 0****Accepted Answers:****1.607 V**

4) For the given cell at 25°C,

**1 point**

$E_{\text{cell}} = 0.9647 \text{ V}$ . Calculate  $\gamma_{\pm}$  for the  $\text{Pb} (\text{NO}_3)_2$  solution from the e.m.f. data given  $E^0_{\text{Pb}^{2+} | \text{Pb}} = -0.126 \text{ V}$  and  $E^0_{\text{Ag}^+ | \text{Ag}} = 0.7991 \text{ V}$

- 0.2255  
 -0.8744  
 0.5566  
 0.3681

**No, the answer is incorrect.****Score: 0****Accepted Answers:****-0.8744**

5) Find out  $E^0_{\text{Fe}^{3+} | \text{Fe}}$ . Given  $E^0_{\text{Fe}^{2+} | \text{Fe}} = -0.44 \text{ V}$  and  $E^0_{\text{Fe}^{3+} | \text{Fe}^{2+}} = 0.77 \text{ V}$

**1 point**

- 0.037 V  
 0.773 V  
 0.995 V  
 0.112 V

**No, the answer is incorrect.****Score: 0****Accepted Answers:****-0.037 V**

6) For the cell

**1 point**

Calculate the value of  $E^0_{\text{cell}}$  at 25 °C. Given  $E^0_{\text{Zn}^{2+} | \text{Zn}} = -0.776 \text{ V}$  and  $E^0_{\text{Cu}^{2+} | \text{Cu}} = 0.337 \text{ V}$

- 0.112 V  
 1.113 V  
 0.298 V  
 0.414 V

**No, the answer is incorrect.****Score: 0****Accepted Answers:****1.113 V**

7) For question 6, calculate the value of  $\Delta G^0$ , equilibrium constant and the value of  $\Delta G$  when one Faraday of electricity is withdrawn from the cell

- 20.48 J mol<sup>-1</sup>, 5.554 x 10<sup>3</sup>, -10536 kJ mol<sup>-1</sup>
- 33.78 kJ mol<sup>-1</sup>, 3.462 x 10<sup>10</sup>, -10.536 kJ mol<sup>-1</sup>
- 214.78 kJmol<sup>-1</sup>, 4.455 x 10<sup>37</sup>, -105.36 kJ mol<sup>-1</sup>
- 2 kJmol<sup>-1</sup>, 2.365 , -105.36 kJ mol<sup>-1</sup>

No, the answer is incorrect.

Score: 0

Accepted Answers:

-214.78 kJmol<sup>-1</sup>, 4.455 x 10<sup>37</sup>, -105.36 kJ mol<sup>-1</sup>

8) Which of the following statements is incorrect? 1 point

- Type I solutes have more concentration in bulk than on the surface
- Type II solutes have more concentration on surface than in bulk
- Type III solutes (surfactants) have a positive value of slope for plot of  $\gamma$  versus concentration
- Type I solutes have a positive value of slope for plot of  $\gamma$  versus concentration

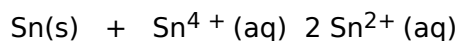
No, the answer is incorrect.

Score: 0

Accepted Answers:

Type III solutes (surfactants) have a positive value of slope for plot of  $\gamma$  versus concentration

9) Calculate the equilibrium constant of the following reaction at 25°C from standard potential data: 1 point



Given  $E^{\circ}_{\text{Sn}^{2+}|\text{Sn}} = -0.14 \text{ V}$  and  $E^{\circ}_{\text{Sn}^{4+}|\text{Sn}^{2+}} = 0.15 \text{ V}$

- 6.5 x 10<sup>5</sup>
- 6.5 x 10<sup>9</sup>
- 6.5 x 10<sup>6</sup>
- 6.5

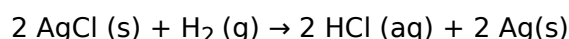
No, the answer is incorrect.

Score: 0

Accepted Answers:

6.5 x 10<sup>9</sup>

10) Devise cell in which the following is the reaction and calculate the standard emf: 1 point



Given  $E^{\circ}_{\text{Cl}^-|\text{AgCl (s)}|\text{Ag (s)}} = 0.22 \text{ V}$  and  $E^{\circ}_{\text{Pt (s)}|\text{H}_2(\text{g})|\text{H}^+} = 0.0 \text{ V}$

- Pt | H<sub>2</sub> (g) | H<sup>+</sup> (aq) | AgCl (s) | Ag(s) , 0.22 V
- Pt | H<sub>2</sub> (g) | H<sup>+</sup> (aq) | AgCl (s) | Ag(s) , 0.55 V
- Pt | H<sub>2</sub> (g) | H<sup>+</sup> (aq) | AgCl (s) | Ag(s) , 0.88 V
- Pt | H<sub>2</sub> (g) | H<sup>+</sup> (aq) | AgCl (s) | Ag(s) , 0.99 V

No, the answer is incorrect.

Score: 0

Accepted Answers:

$Pt | H_2 (g) | H^+ (aq) | AgCl (s) | Ag(s) , 0.22 V$

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