Assignment 11

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

Due on 2018-10-17, 23:59 IST.

1) If in a redox reaction \((\text{pe} - \text{pe}_0)\) value is negative then oxidised form will predominate.

- True
- False

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

2) During denitrification of nitrate\((\text{NO}_3^-\text{to N}_2)\), concentration of nitrate was 1 mole/L. Then what is the electron equivalents for nitrogen_________.

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

3) A waste water contains 15mg/l toluene. COD test is conducted using \(\text{Cr}_2\text{O}_7^{2-}\), how much COD does the toluene contributes to solution ________mg \(\text{O}_2/L\)

No, the answer is incorrect.
Score: 0
Accepted Answers:
5) During oxidation of NH₃ to NO₃⁻ by oxygen, consider the following half reactions
O₂(aq) + 4e⁻ + 4H⁺ ⇌ 2H₂O (1) \((\log K = 83.12)\)
NH₃(aq) + 3H₂O ⇌ NO₃⁻ + 9H⁺ + 8e⁻ \((2)\) \((\log K = -109.84)\)
If, \([NH₃] = 2\times10^{-4} \text{ M}, [NO₃⁻] = 5\times10^{-4} \text{ M}, [O₂] = 10^{-3}\) at pH = 7, what is the Q/K value__________ \(*10^{-63}\)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 1.7-1.75

6) Calculate pe for following reaction if pH is 10.3 and concentration of all species is \(10^{-3} \text{ M}\)
CrO₄²⁻ + 3e⁻ + 8H⁺ ⇌ 4H₂O + Cr³⁺ \(K = 10^{77}\)
pe = __________

No, the answer is incorrect.
Score: 0
Accepted Answers:
-1.82, 1.04

7) If in a system, there are two half reactions having different redox potential pe₁ and pe₂ respectively. 1ˢᵗ half reaction will undergo reduction if pe₂ is ________ than pe₁ (less/more).

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Regex Match) less

8) In the half reaction SO₄²⁻ + 10H⁺ + 8e⁻ ⇌ H₂S + 4H₂O, pe⁰(w) = -3.67, [H₂S] = 2\times10^{-4} and [SO₄²⁻] = 10^{-3}. Then, what is the pe value ____________

No, the answer is incorrect.
Score: 0
Accepted Answers:
5.58
9) Pb^{4+}/Pb^{2+}, Cu^{2+}/Cu^{+} and Co^{3+}/Co^{2+} are three redox couples present in a solution having $\text{pe}^0$ values 28.64, 2.69 and 32.40 respectively, then which specie will act as strongest reductant ____________

- Pb^{4+}
- Cu^{2+}
- Co^{3+}

No, the answer is incorrect.
Score: 0  
Accepted Answers:
-5.58

10) In flue-gas (exhaust gas) desulfurization, $\text{SO}_2$ is captured in water, where it hydrolyses to $\text{H}_2\text{SO}_3$, a relatively strong acid. The sulphite ion, $\text{SO}_3^{2-}$, can be oxidized to sulphate by reacting with dissolved oxygen. In an ideal solution at pH 9.0 and with a $(\text{SO}_4^{2-})/(\text{SO}_3^{2-})$ ratio of 9, the $\text{pe}$ value is _________. ($\log K = -3.65$)

- 10.34
- -10.34
- 4.26
- -4.26

No, the answer is incorrect.
Score: 0
Accepted Answers:
-10.34

11) Lead (Pb) is a powerful neurotoxin. In the past, elemental lead was used extensively in water distribution systems as the primary component of pipes, in solder, and in alloys in metal valves. The water adjacent to some pure Pb(s) in a distribution system is at pH 8.4 and contains 75 $\mu$g/L Pb^{2+}. Concentration of dissolved oxygen that would be present in the solution at equilibrium is _________ $\mu$g/L. ($\log K_{\text{Pb}}= 4.27$ (oxidation of Pb$^0$), $\log K_{\text{O}_2}= 86$)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 0

12) In above problem if 2 mg/L $\text{O}_2(aq)$ is present in water, would oxidation of more Pb(s) or reduction of Pb^{2+} be favoured___________ (oxidation/reduction).
No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) oxidation