# ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

## SOLUTION-15(CLASS-11)

## TOPIC- REDOX EQUILIBRIA

## SUBTOPIC- ION-ELECTRON METHOD AND OXIDATION METHOD

**SUBJECT – CHEMISTRY** **F.M. - 15**

**DURATION – 30 mins** **DATE -01.07.20**

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1.1 **Which of the following represents a redox reaction?**

(a) $NaOH + HCl \rightarrow NaCl + H_2O$

(b) $BaCl_2 + H_2SO_4 \rightarrow BaSO_4 + 2HCl$

(c) $CuSO_4 + 2H_2O \rightarrow Cu(OH)_2 + H_2SO_3$

(d) $Zn + 2HCl \rightarrow ZnCl_2 + H_2$

**Ans. d**

1.**2 Which reaction involves neither oxidation nor reduction?**

(a) $CrO_4^{2-} \rightarrow Cr_2O_7^{2-}$ (b) $Cr \rightarrow CrCl_3$ (c) $Na \rightarrow Na^+$ (d) $2S_2O_3^{2-} \rightarrow S_4O_6^{2-}$

**Ans. a**

1.3 **Zn gives $H_2$ gas with $H_2SO_4$ and HCl but not with $HNO_3$ because-**

(a) Zn acts as an oxidising agent when it reacts with $HNO_3$-

(b) $HNO_3$ is weaker acid than $H_2SO_4$ and HCl

(c) In electrochemical series Zn is above hydrogen

(d) $NO_3^-$ is reduced in preference to hydronium ion

**Ans. d**

1.4 **A compound of Xe and F is found to have 53.5% of Xe. What is the oxidation number of Xe in this compound?**

(a) -4 (b) 0 (c) +4 (d) -6

**Ans. d**

1.5 **A solution contains $Fe^{2+}$, $Fe^{3+}$ and $I^-$ ions. This solution was treated with iodine oat 35°C. $E^o$ for $Fe^{3+}/Fe^{2+}$ is 0.77V and $E^o$ for $I_2/2I^-$ = 0.536V. The favorable redox reaction is-**

(a) $I_2$ will be reduced to $I^-$ (b) there will be no redox reaction (c) $I^-$ will be oxidised to $I_2$

(d) $Fe^{2+}$ will be oxidised to $Fe^{3+}$

**Ans. c**

1.6 **One mole of $N_2H_4$ loses 10 moles of electrons to form a new compound y. Assuming that all nitrogen appears in the new compound, what is the oxidation state of nitrogen in y.**
(a) -1 (b) -3 (c) +3 (d) +5

**Ans. c**

1.7 **The equivalent mass of oxidising agent in the following reaction is:**

**$SO_2 + 2H_2S \rightarrow 3S + 2H_2O$**

(a) 32 (b) 64 (c) 16 (d) 8

**Ans. c**

1.8 **In the reaction:**

**$3Br_2 + 6CO_3^{2-} + 3H_2O \rightarrow 5Br^- + BrO_3^- + 6HCO_3^-$**

a) Bromine is oxidised and carbonate is reduced
b) Bromine is reduced and water is oxidized
c) Bromine is neither reduced nor oxidized
d) Bromine is both reduced and oxidized
**Ans. d**

1.9 **Which of the following cannot function as an oxidising agent?**
(a) $I^-$ b) Si(s) c) $NO_3^-$(aq) d) $Cr_2O_7^{2-}$
**Ans. a**

1.10 **The oxidation number of Pt in $[Pt(C_2H_4)Cl_3]^-$ is:**

(a) +1 (b) +2 (c) +3 (d) +4
**Ans. b**

1.11 **$aCr_2O_3 + bNa_2O_2 + cH_2O \longrightarrow mNa_2CrO_4 + nNaOH$**
(a) b=3, n=4 b) b=3 n= 2 c) b=1, n=2 d) b=3, n= 4
**Ans.**

1.12 **The oxidation number of Cr in $Cr_2O_3$ is-**
(a) +6 b) +5 c) +2 d) +3
**Ans.**

1.13 **Determine the equivalent weights of the following marked compounds by applying the oxidation number and electronic methods-**

**$\underline{MnO_2}$ + $4H^+$ ⟶ $Mn^{2+}$ + $2H_2O$**

(a) 25 b) 37.2 c) 158 d) 27.5

**Ans. d**

1.14 **Determine the equivalent weights of the following marked compounds by applying the oxidation number and electronic methods-**

**$\underline{HNO_3}$ + $H^+$ ⟶ $NO$ + $2H_2O$**

**(**a) 63 (b) 21 (c) 13 (d) 31

**Ans. b**

1.15 **Determine the equivalent weights of the following marked compounds by applying the oxidation number and electronic methods-**

**$\underline{SO_2}$ + $2H_2O$ ⟶ $H_2SO_4$**

**(**a) 32 b) 64 c) 25 d) 23

**Ans. a**

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