CHEMISTRY

BOOKS - GRB CHEMISTRY (HINGLISH)

REDOX REACTIONS

Others

1. Find the of oxidation of Co in $Ag[Co(CO)_4]$

A. 1

B. -1

C. Zero

D. None of these

Answer: b

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2. Which of the following reactions involve oxidation and reduction?

A. $NaBr + HCl \rightarrow NaCl + HBr$

B. $HBr + AgNO_3 \rightarrow AgBr + HNO_3$

C. $H_2 + Br_2 \rightarrow 2HBr$

D. $Na_2O + H_2SO_4 \rightarrow Na_2SO_4 + H_2O$

Answer: c

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3. When ammonia is passed over heated copper oxide, the metallic coper is obtained. The reaction shows that ammonia is :

A. a dehydrating agent

B. an oxidising agent

C. a reducing agent

D. a nitrating agent

Answer: c

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4. Manganese achieves its maximum oxidation state in its compound :

A. MnO_2

B. Mn_3O_4

C. $KMnO_4$

D. K_2MnO_4

Answer: c

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5. Oxidation number of underlined elements are $\underline{N}_2O_5$, $\underline{S}O_3^{2-}$, $\underline{N}H_4^+$:

A. $+5, 2+, -3$

B. $+6, -2, +3$

C. $+6, +2, -3$

D. $+5, +4, -3$

Answer: d

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6. Phosphorous has the oxidation state of $+3$ in :

A. phosphours acid (H_3PO_3)

B. ortho phosphoric acid (H_3PO_4)

C. meta phosphoric acid (HPO_3)

D. pyro phosphoric acid $(H_4P_2O_7)$

Answer: a

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7. Which statement is wrong?

A. Oxidation number of oxygen is $+1$ in peroxides

B. Oxidation number of oxygen is $+2$ in oxygen difluoride

C. Oxidation number of oxygen is $-\frac{1}{2}$ in superoxides

D. Oxidation number of oxygen is (-2) in most of its compounds

Answer: a

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8. The incorrect order of decreasing oxidation number of S in compound is :

A. $H_2S_2O_7 > Na_2S_4O_6 > Na_2S_2O_3 > S_8$

B. $H_2SO_5 > H_2SO_3 > SCl_2 > H_2S$

C. $SO_3 > SO_2 > S_8 > H_2S$

D. $H_2SO_4 > SO_2 > H_2S > H_2S_2O_8$

Answer: d

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9. The reaction $3ClO^-(aq) \rightarrow ClO_3^-(aq) + 2Cl^-(aq)$ an example of :

A. oxidation

B. reduction

C. disproportionation

D. decomposition reaction

Answer: c

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10. Oxidizing agents are species which :

A. lose electrons

B. gain electrons

C. neither lose nor gain electrons

D. take part of the solid-state reactions

Answer: b

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11. In which of the following reactions does H_2O_2 acts as a resucing agents ?

A. $2FeCl_2 + 2HCl + H_2O \rightarrow 2FeCl_3 + 2H_2O$

B. $Cl_2 + H_2O_2 \rightarrow 2HCl + O_2$

C. $2HI + H_2O_2 \rightarrow 2H_2O + I_2$

D. $H_2SO_3 + H_2O_2 \rightarrow H_2SO_4 + H_2O$

Answer: b

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12. The oxidation number of an atom in a given species (molecule, ion of free atom) is the :

A. acutal charge of the atom

B. valency of the atom

C. formal charge of the atom

D. actual charge of the atom is the atom exits as a monotomic ion, or the hypothetical charge assigned to the atom in the species by sipmple rules.

Answer: d

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13. The oxidation number of Cr is $+6$ in :

A. $FeCr_2O_4$

B. $Fe_2(CrO_4)_2$

C. $Cr_2(SO_4)O_3$

D. $\left[Cr(OH)_4\right]^-$

Answer: b

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14. A compound contains three elements A, B and C, if the oxidation number of $A = +2 B = +5$ and $C = -2$ then possible formula of the compound is

A. ABC_2

B. $A_2(BC_3)_2$

C. $A_3(BC_4)_2$

D. $A_3(B_4C)_2$

Answer: c

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15. Oxidattion is a process in which :

A. oxidation number inceases

B. electrons are lost

C. de-electronation takes place

D. all the above happen

Answer: d

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16. Which of the following is not a redox reaction?

A. $Mg + N_2 \rightarrow Mg_3N_2$

B. $MnO_4 + C_2O_4^{2-} \rightarrow Mn^{2+} + CO_2$

C. $CuSO_4 + KI \rightarrow Cu_2I_2 + K_2SO_4$

D. $AgCl + NH_3 \rightarrow \left[Ag(NH_3)_2\right]Cl$

Answer: d

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17. Oxidation states of Cu and Fe in $CuFeS_2$ are respectively :

A. I and II

B. II and III

C. I and III

D. II and II

Answer: a

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18. What is the oxidation state of Sn in $Ca_2Sn_2Si_6O_{18}$?

A. I

B. II

C. III

D. IV

Answer: d

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19. Consider the salt $K_xH_y(C_2O_4)_z.2H_2O$.

The relationship between x, y and z is :

A. $x + y - z = 0$

B. $x + y = 2z$

C. $x + y + z = 0$

D. None of these

Answer: b

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20. The average oxidation state of sulphur in sodium tetrathonate $(Na_2S_4O_6)$ is :

A. 0

B. 5

C. 2.5

D. 3.0

Answer: c

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21. The difference in the oxidation numbers of two types of sulphul atoms in $Na_2S_4O_6$ is.....

A. 5

B. 4

C. 3

D. 2

Answer: a

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22. Select the reaction which describes the existence of $I_2O_5(s)$ as $(IO_2^+)(IO_3^-)$:

A. $I_2O_5 + HF \rightarrow HIO_2 + FIO_3$

B. $I_2O_5 + HF \rightarrow IO_2F + HIO_3$

C. $I_2O_5 + HF \rightarrow HOI + IO_4F$

D. $I_2O_5 + HF \rightarrow IOF + HIO_4$

Answer: b

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23. In $FeCr_2O_4$, the oxidation numbers of Fe and Cr are :

A. $+2$ and $+3$

B. 0 and $+2$

C. $+2$ and $+6$

D. $+3$ and $+6$

Answer: a

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24. The oxidation number of P in $Mg_2P_2O_7$ is

A. $+3$

B. $+2$

C. $+5$

D. -3

Answer: c

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25. The oxidation states of sulphur in the anions SO_3^{2-}, $S_2O_4^{2-}$, and $S_2O_6^{2-}$ follow the order

A. $S_2O_6^{2-} < S_2O_4^{2-} < SO_3^{2-}$

B. $S_2\_O_4^{2-} < SO_3^{2-} < S_2O_6^{2-}$

C. $SO_3^{2-} < S_2O_4^{2-} < S_2O_6^{2-}$

D. $S_2O_4^{2-} < S_2O_6^{2-} < SO_3^{2-}$

Answer: b

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26. The resonating structures of cyanate ion are $O = C = \overset{1-}{N} \leftrightarrow \overset{1-}{O} - C \equiv N \leftrightarrow \overset{1+}{\equiv} C - \overset{2-}{N}$. The correct set of oxidation states of O, C and N respectively with the most stable structure out of the above is :

A. $-2, +4, 3$

B. $-2, +4, -3$

C. $2, +4, -3$

D. $0, +4, -5$

Answer: b

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27. Which ordering of compounds is according to the decreasing order of the oxidation state of nitrogen ?

A. HNO_3, NO, NH_4Cl, N_2

B. HNO_3, NO, N_2, NH_4Cl

C. Hno_3, NH_4Cl, NO, N_2

D. NO, HNO_3, NH_4Cl, N_2

Answer: b

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28. In the reaction $2Ag + 2H_2SO_4 \rightarrow Ag_2SO_4 + 2H_2O + SO_2, H_2SO_{40}$ acts as a/an

A. an oxidizing agent

B. a reducing agent

C. a catalyst

D. an acid as well as an oxidant

Answer: d

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29. Among these, identify the species with an atom in $+6$ oxidation state:

.

A. MnO_4^-

B. $Cr(CN)_6^{3-}$

C. NiF_6^{2-}

D. CrO_2Cl_2

Answer: d

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30. Oxidation number of iron $Na_2\left[Fe(CN)_5\left(NO^+\right)\right]$ is :

A. $+2$

B. $+3$

C. $+\frac{8}{3}$

D. None of these

Answer: a

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31. One mole of N_2H_4 loses ten moles of electrons to form a new compound A. Assuming that all the nitrogen appears in the new compound, what is the oxidation state of nitrogen in A? (There is no change in the oxidation state of hydrogen.)

A. -1

B. -3

C. $+3$

D. $+5$

Answer: c

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32. The oxidation number of S in S_8, S_2F_2, and H_2S, respectively, are

A. $0,\ +1$ and -2

B. $+2,\ +1$ and -2

C. $0,\ +1$ and $+2$

D. $-2,\ +1$ and -2

Answer: a

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33. Among es the following, the pair having both the metals in their highest oxidation state is :

A. $\left[Fe(CN)_6\right]^{3-}$ and $\left[Co(CN)_6\right]^{3-}$

B. CrO_2Cl_2 and MnO_4^-

C. TiO_2 and MnO_2

D. $[MnCl_4]^{2-}$ and $[NiF_6]^{2-}$

Answer: b

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34. Which of the following reaction depicts the oxidsing behaviour of H_2SO_4?

A. $2HI + H_2SO_4 \rightarrow I_2 + SO_2 + 2H_2O$

B. $Ca(OH)_2 + H_2SO_4 \rightarrow CaSO_4 + 2H_2O$

C. $NaCl + H_2SO_4 \rightarrow NaHSO_4 + HCl$

D. $2PCl_5 + H_2SO_4 \rightarrow 2POCl_3 + 2HCl + SO_2Cl_2$

Answer: a

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35. The oxidation state of Cr in $\left[Cr(NH_3)_4Cl_2\right]^+$ is:

A. $+3$

B. $+2$

C. $+1$

D. 0

Answer: a

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36. which of the following is a redox reaction ?

A. $NaCl + KNO_3 \rightarrow NaNO_3 + KCl$

B. $CaC_2O_4 + 2HCl \rightarrow CaCl_2 + H_2C_2O_4$

C.

$$Mg(OH)_2 + 2NH +_4 Cl \rightarrow MgCl_2 + 2NH_4Cl \rightarrow MgCl_2 + 2NH +$$

D. $Zn + 2AgCN \rightarrow 2Ag_Zn(CN)_2$

Answer: b

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37. A substance which participates readily in both acid-base and oxidation-reduction reactions is:

A. Na_2CO_3

B. KOH

C. $KMnO_4$

D. $H_2C_2O_4$

Answer: d

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38. Which of the following may act as an oxidizing and reducing agent ?

A. H_2O_2

B. MnO_2

C. SO_2

D. All of these

Answer: d

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39. In compound HN_3 (hydrazoic acid) , oxidation state of N atoms are :

A. $0, 0, 3$

B. $0, \ -2, \ +1$

C. $1, 1, \ -3$

D. $-3, \ -3, \ -3$

Answer: b

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40. In the reaction $Ca + H_2 \rightarrow CaH_2$ select the incorrect statement.

A. Calcium undergoes oxidation

B. Hydrogen undergoes reduction

C. Calcium acts as oxidising agent

D. Hygrogen acts as oxidising agent

Answer: c

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41. Which of the following is not a redox reaction ?

A. $CO + NO_2 \rightarrow CO_2 + NO$

B. $3SnCl_2 + 6HCl + 2NO \rightarrow 3SnCl_4 + 2NH_2OH$

C. $PCl_3 + Cl_2 \rightarrow PCl_5$

D. $SiO_2 + 4HF \rightarrow SiF_4 + 2H_2O$

Answer: d

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42. The oxidation states of the most electronegative elements in the products of the reaction between BaO_2 and H_2SO_4 are

A. 0 and -1

B. -1 and -2

C. -2 and 0

D. -2 and $+1$

Answer: b

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43. Which equation represents an oxidation-reduction reaction?

A. $H_2SO_4 + 2NH_3 \rightarrow (NH_4)_2SO_4$

B. $H_2SO_4 + Na_2CO_3 \rightarrow Na_2SO_4 + H_2O + CO_2$

C. $2K_2CrO_4 + H_2SO_4 \rightarrow K_2Cr_2O_7 + K_2SO_4 + H_2O$

D. $2H_2SO_4 + Cu \rightarrow CuSO_4 + 2H_2O + SO_2$

Answer: d

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44. For which substance is the oxiadation number of vandium the same as that in the VO_3^- ion ?

A. VN

B. VCl_3

C. $VOSO_4$

D. VF_5

Answer: d

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45. A substance which participates readily in both acid-base and oxidation-reduction reactions is:

A. $NaCO_3$

B. KOH

C. $KMnO_4$

D. $H_2C_2O_4$

Answer: d

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46. $p_4(s) + 3OH^-(aq)$. For this reaction the oxidizing and reducing agents are, respectively :

A. P_4 and OH^-

B. OH^- and P_4

C. P_4 and H_2O

D. P_4 and P_4

Answer: d

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47. What is the average oxidation number of tungesten in the ion , $W_6O_6Cl_{12}^{2-}$?

A. 2.7

B. 3.3

C. 3.7

D. 4.3

Answer: c

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48. In which case does chromium undergo reduction?

A. $CrO_3 \rightarrow CrOF_3$

B. $Cr^{3+} \rightarrow Cr(OH)_4^-$

C. $2CrO_4^{2-} \rightarrow Cr_2O_7^{2-}$

D. $Cr^{3+} \rightarrow CrO_4^{2-}$

Answer: a

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49. In which species does the underlined elements have an oxidation number of $+2$?

A. SO_2Cl_2

B. $Fe(CN)_6^{4-}$

C. HNO_2

D. $Ni(CO)_4$

Answer: b

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50. Which transformation is an oxidation ?

A. $VO_3^- \rightarrow VO_2^+$

B. $CrO_2^- \rightarrow CrO_4^{2-}$

C. $SO_4^{2-} \rightarrow SO_3^{2-}$

D. $NO_3^- \rightarrow VO_2^+$

Answer: b

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51. Which represents an oxidation ?

A. $BrO^- \rightarrow Br_2$

B. $NO_2 \rightarrow N_2O_4$

C. $Cr^{3+} \rightarrow CrO_4^{2-}$

D. $VO_3^- \rightarrow VO_2^+$

Answer: c

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52. For the balanced equation :

$8H^+(aq) + 5Fe^{2+}(aq) + MnO_4^-(aq) \rightarrow 5Fe^{3+}(aq) + Mn^{2+}(aq) + 4H_2$

Which statement is correct ?

A. Fe^{2+} (aq) undergoes oxidation

B. Fe^{2+} (aq) is the oxidizing agent

C. H^{+} (aq) undergoes oxidation

D. H^{+} (aq) is the oxidizing agent

Answer: a

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53. Which substance can act only as a reducing agent ?

A. I_2

B. $BrCl$

C. $NaBr$

D. HIO_4

Answer: c

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54. Which species can act an oxidizing agent but not as a reducing agent ?

A. Cl_2

B. Cl^-

C. ClO_2^-

D. ClO_4^-

Answer: d

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55. What is the oxidation number of Ti in the compound $Na_2Ti_3O_7$?

A. -2

B. $+4$

C. $+6$

D. $+12$

Answer: b

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56. Which range includes the average oxidation state of S in $Na_2S_4O_6$?

A. Less than 0

B. 0 to $+2$

C. $+2$ to $+4$

D. Greater than $+4$

Answer: c

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57. Which change represents an oxidation ?

A. $NO_2^- \rightarrow N_2$

B. $VO^{2+} \rightarrow VO_3^-$

C. $ClO^- \rightarrow Cl^-$

D. $CrO_4^{2-} \rightarrow Cr_2O_7^{2-}$

Answer: b

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58. What is the oxidation number of Mo in MoO_2Cl_2 ?

A. 0

B. $+3$

C. $+5$

D. $+6$

Answer: d

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59. All of the reaction below represent oxidation-reduction processes except the : s

A. combustion of tin n chlorine gas.

B. decomposition of potasssium chlorate.

C. neutralization of sodium hydrochloric acid.

D. reaction of magnesium with hydrochloric atoms.

Answer: c

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60. In which pair of substances do the nitrogen atoms have the same oxidation state ?

A. HNO_3 and N_2O_5

B. NO and HNO_2

C. N_2 and N_2O

D. HNO_2 and HNO_3

Answer: a

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61. In the equation below, which species acts the oxidation agent?

$$Pb(s) + PbO_2(s) + H^+(aq) + 2HSO_4^-(aq) \rightarrow 2PbSO_4(s) + 2H_2O(l)$$

A. $Pb(s)$

B. $PbO_2(s)$

C. H^+(aq)

D. HSO_4^-(aq)

Answer: b

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62. In which species does sulphur have the lowest oxidation state?

A. SCl_2

B. OSF_2

C. H_2SO_3

D. SF_6

Answer: a

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63. What is the average oxidation state of copper in the superconductor $Yba_2Cu_3O_7$?

A. $+2$

B. $+2.33$

C. $+2.67$

D. $+3$

Answer: b

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64. Which species has an atom with an oxidation number of $+3$?

A. ClO_2^-

B. PO_4^{3-}

C. $S_2O_3^{2-}$

D. NO_2^+

Answer: a

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65. What is the oxidation number of rhenium in $Ca(ReO_4)_2$?

A. $+1$

B. $+3$

C. $+6$

D. $+7$

Answer: d

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66. When the half-reaction $NO_3^- \rightarrow NO$ is balanced for one NO_3^- in acid solution..... Electrons(s) is (are)..... .

A. 3 gained

B. 1gained

C. 1 lost

D. 3 lost

Answer: a

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67. In the reaction $ClO_3^-(aq) + 5Cl^-(aq) + 6H^+(aq) \rightarrow 3Cl_2(g) + 3H_2O(l)$ the oxidizing and reducing agents are , respectively :

A. Cl^- (aq) and ClO_3^- (aq)

B. ClO_3^- (aq) and H^+ (aq)

C. ClO_3^- (aq) and H^+ (aq)

D. Cl^{-0} (aq) and H^+ (aq)

Answer: b

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68. What is the oxidation number of C in formaldehyde, CH_2O ?

A. -2

B. 0

C. $+2$

D. $+4$

Answer: b

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69. Which one of the following connot act as an oxidizing agent ?

A. S^{2-}

B. SO_3^{2-}

C. SO_4^{2-}

D. $S_2O_8^2$

Answer: a

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70. What is the oxidation number of As in the compound $K(NH_4)_2AsO_4.6H_2O$?

A. -3

B. $+1$

C. $+3$

D. $+5$

Answer: d

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71. $aMnO_4^- + bI^- + cH^+ \rightarrow dMn^{2+} + eI_2 + fH_2O$

In above balance reaction, value of $\left(\frac{c}{d}\right)$ will be :

A. 1.3

B. 1.2

C. 8

D. 5

Answer: c

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72. In the reaction,

$xFeCl_3 + yH_2S \rightarrow FeCl_2 + S + HCl$

A. $x = 2, y = 1$

B. $x = 3, y = 2$

C. $x = 4, y = 3$

D. $x = 2, y = 2$

Answer: a

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73. For the redox reaction $xP_4 + yHNO_3 \rightarrow H_3PO_4 + NO_2 + H_2O$

A. $x = 1, y = 5$

B. $x = 32, y = 10$

C. $x = 1, y = 20$

D. $x = 1, y = 15$

Answer: c

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74. In the reaction $xHI + yHNO_3 \rightarrow NO + I_2 + H_2O$

A. $x = 3, y = 2$

B. $x = 2, y = 3$

C. $x = 6, y = 2$

D. $x = 6, y = 1$

Answer: c

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75. For the redox reation

$MnO_4^- + C_2O_4^{2-} + H^+ \rightarrow Mn^{2+}CO_2 + H_2O$

The correct stoichiometric coefficients of $Mno_4^-, C_2O_4^{2-}$ and H^+ respectively:

A. 2, 5, 16

B. 16, 5, 2

C. 5, 16, 2

D. 2, 16, 5

Answer: a

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76. In the half reaction :

$2ClO_3^- \rightarrow Cl_2$

A. 5 electrons are gained

B. 5 electrons are liberated

C. 10 electrons are gained

D. 10 electrons are liberated

Answer: c

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77. In the reaction $A^{-n2} + xe^- \rightarrow A^{-n1}$. Here, x will be :

A. $n_1 + n_2$

B. $n_2 - n_1$

C. $n_1 - n_2$

D. $n_1 \times n_2$

Answer: c

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78. Cu reacts with HNO_3 according to the equation

$$Cu + HNO_3 \rightarrow Cu(NO_3)_2 + NO_2 + H_2O$$

If NO and NO_2 are formed in a 2:3 ratio, what is the coefficient for Cu when the equation is balanced with the simplest whole numbers ?

A. 2

B. 3

C. 6

D. 9

Answer: d

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79. In the reaction

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

A. Bromine is oxidized and the carbonate radical is reduced.

B. Bromine is reduced and the carbonate radical is oxidized.

C. Bromine is neither reduced nor oxidized .

D. Bromine is both reduced and oxidzed.

Answer: d

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80. In which of the following reactions is there a change in the oxidation number of nitrogen atom?

A. $2NO_2 \rightarrow N_2O_4$

B. $NH_3 + H_2O \rightarrow NH_4^+ + OH^-$

C. $N_2O_5 + H_2O \rightarrow 2HNO_3$

D. None of these

Answer: d

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81. Which reaction does not represent auto redox or disproptionation?

A. $Cl_2 + OH^- \rightarrow Cl^- + ClO_3^- + H_2O$

B. $2H_2O_2 \rightarrow H_2O + O_2$

C. $2Cu^+ \rightarrow Cu^+ + Cu$

D. $(NH_4)_2Cr_2O_7 \rightarrow N_2 + Cr_2O_3 + 4H_2O$

Answer: d

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82. In the reaction $X^- + XO_3^- + H^+ \rightarrow X_2 + H_2O$, the molar ratio in which X^- and XO_3^- react is :

A. $1:5$

B. $5:1$

C. $2:3$

D. $3:2$

Answer: b

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83. CN^- is oxidised by NO_3^- in presence of acid :

$can^- + bNO_3^- + cH^+ \rightarrow (a+b)NO + aCO_2 + \frac{c}{2}H_2O$

`What are the values of a, b, c in that order:

A. 3, 7, 7

B. 3, 10, 7

C. 3, 10, 10

D. 3, 7, 10

Answer: d

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84. The following equations are balanced atomwise and chargewise.

(p) $Cr_2O_7^{2-} + 8H^+ 3H_2O_2 \rightarrow 2Cr^{3+} + 7H_2O + 3O_2$

(q) $Cr_2O_7^{2-} + 8H^+ 5H_2O_2 \rightarrow 2Cr^{3+} + 9H_2O + 4O_2$

(r) $Cr_2O_7^{2-} + 8H^+ 7H_2O_2 \rightarrow 2Cr^{3+} + 11H_2O + 5O_2$

The precies equation/equations representing the oxidation of H_2O_2 is/are:

A. (P) only

B. (Q) only

C. (R) only

D. all the three

Answer: a

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85. During the disproportionation of I_2 to iodide and iodate ions, the ratio of iodate and iodide ions formed in alkaline medium is

A. $1:5$

B. $5:1$

C. $3:1$

D. $1:3$

Answer: a

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86. Which of the following equation is correctly balanced ?

A. $5BiO_3^- + 22H^+ + Mn^{2+} \rightarrow 5BiO^{3+} + 7H_2O + MnO_4^-$

B. $5BiO_3^- + 14H^+ + 2Mn^{2+} \rightarrow 5BiO^{3+} + 7H_2O + 2MnO_4^-$

C. $5BiO_3^- + 4H^+ + Mn^{2+} \rightarrow 2BiO^{3+} + 2H_2O + MnO_4^-$

D. $5BiO_3^- + 12H^+ + 3Mn^{2+} \rightarrow 6BiO^{3+} + 6H_2O + 3MnO_4^-$

Answer: b

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87. The values of x, y and z in the reaction are respectively:

$4KO_2 + H_2O + xH_2O + yCO_2 \rightarrow 4KHCO_3 + zO_2$

A. 3, 6, 6

B. 2, 4, 3

C. 3, 2, 5

D. 4, 3, 6

Answer: b

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88. For the balanced redox reaction:

$aNO_3^- + bCu_2O + cH^+ \rightarrow dNO + eCu^{2+} + H_2O$

where a, b, c, d and e are stoichiometric coefficients if 'c' is 14, then the value of 'e' is :

A. 2

B. 3

C. 6

D. 7

Answer: c

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89. Consider the balanced chemical reaction:

$AI_2O_5 + bBrF_3 \rightarrow cIF_5 + dO_2 + eBr_2$

Calculate the value of (b+c+e)/(a).

A. 10

B. 7

C. 6

D. 3

Answer: b

Watch Video Solution

90. What are the value of p, q, r and s for the following reaction ?

$pO_3 + qHI \rightarrow I_2 + sH_2O$

A. 1, 6, 3, 1

B. 1, 6, 3, 3

C. 1, 6, 6, 3

D. 1, 6, 3, 6

Answer: b

Watch Video Solution

91. The unbalanced equation for the reaction of P_4S_3 with nitrate in aqueous acidic medium is given below :

$$P_4S_3 + NO_3^- \rightarrow H_3PO_4 + SO_4^{2-} + NO$$

the number of moles of water reuired per mole of P_4S_3 is :

A. 18

B. $\frac{8}{3}$

C. 8

D. 28

Answer: b

Watch Video Solution

92. $\_\_ClO_3^- + \_\_I^- + H^+ \rightarrow \_\_Cl^- + \_\_I_2 + \_\_H_2O$

When this equation is balanced with whole number coefficients, what is the H^+ / I_2 coefficient ratio ?

A. $\frac{2}{1}$

B. $\frac{3}{1}$

C. $\frac{6}{1}$

D. Some other ratio

Answer: a

Watch Video Solution

93. $MnO_4^- + NO_2^- + H^+ \rightarrow Mn^{2+} + NO_3^- + H_2O$

When this equation is balanced correctly this equation is balanced with the smallest integer coefficients ?

A. 1

B. 6

C. 8

D. 16

Answer: b

Watch Video Solution

94. $Cl_2 + OH^- \rightarrow Cl^- + ClO_3^-$

What is the coefficient for OH^- when this equation is balanced with the smallest interger coefficients ?

A. 2

B. 3

C. 4

D. 6

Answer: d

Watch Video Solution

95. $\_\_Sn^{2+}(aq) + \_\_NO_3^-(aq) + \_\_H^+(aq) \rightarrow \_\_Sn^{4+}(aq) + \_\_NO(g) + \_\_H_2O$

What is the coefficent for H^+ (aq) when the equation above is balanced correctly with the smallesr interger coefficients?

A. 2

B. 4

C. 6

D. 8

Answer: d

Watch Video Solution

96. What is the coefficient for OH^- after the equation $\_\_Br_2 + \_\_OH^- \rightarrow \_\_Br^- + \_\_BrO_3^- + \_\_H_2O$ is balanced with the smallest

interger coefficients ?

A. 3

B. 6

C. 12

D. 18

Answer: b

Watch Video Solution

97. $\_\_Sn^{2+}(aq)+\_\_MnO_4^-(aq)+\_\_H^+(aq) \rightarrow \_\_Sn^{4+}(aq)+\_\_MnO^{2+}(aq)$

$\_\_H_2O(l)$

When this equation for the reaction of Sn^{2+} (aq) and MnO_4^- (aq) is balanced correctly, what is the ratio, Sn^{2+}/MnO_4^- ?

A. $\frac{1}{1}$

B. $\frac{1}{2}$

C. $\frac{2}{1}$

D. $\frac{5}{2}$

Answer: d

Watch Video Solution

98. What is ther coefficient for H^+ when the half equation is balanced with the smallest whole number coefficients?

A. 2

B. 4

C. 6

D. 8

Answer: b

Watch Video Solution

99. When the reaction: $CL^- + ClO_3^- \rightarrow Cl_2 + H_2O$ is balanced in acid solution what is the ratio of Cl^- to ClO_3^- ?

A. $\frac{1}{1}$

B. $\frac{2}{1}$

C. $\frac{3}{1}$

D. $\frac{5}{1}$

Answer: d

Watch Video Solution

100. What is the coefficient for O_2 when the equation $NH_3 + O_2 \rightarrow NO + H_2O$ is balanced with smallest whole number coefficients ?

A. 2

B. 3

C. 4

D. 8

Answer: d

Watch Video Solution

101. When the equation Sn^{2+} (aq) $+IO_3^-(aq) + H^+(aq) \rightarrow Sn^{4+}(aq) + I_2(aq) + H_2O(l)$ is balanced, what is the $Sn^{2+}(aq)/IO_3^-(aq)$ mole ratio?

A. $\frac{1}{1}$

B. $\frac{2}{1}$

C. $\frac{1}{2}$

D. $\frac{5}{2}$

Answer: d

Watch Video Solution

102. Ethanol reacts with dichromate ion in acid solution according to the equation:

$$C_2H_5OH(l) + Cr_2O_7^{2-}(aq) + H^+(aq) \rightarrow CO_2(g) + Cr^{3+}(aq) + H_2O(l)$$

What is the coefficient for $H^+(aq)$ when this equation is balanced with the smallest whole number coefficients?

A. 10

B. 12

C. 14

D. 16

Answer: d

Watch Video Solution

103. What is the coefficient for Zn when the equation below is balanced with the smallest whole number coefficient?

$Zn + H^+(aq) + NO_3^-(aq) \rightarrow Zn^{2+}(aq) + N_2O(g) + H_2O(l)$

A. 2

B. 4

C. 6

D. 8

Answer: b

Watch Video Solution

104. What is the coefficient for O_2 when the following reaction

$\_\_As_2S_3 + \_\_O_2 \rightarrow As_2O_3 + \_\_SO_2$

is correctly balanced with the smallest integer coefficient

A. 5

B. 6

C. 8

D. 9

Answer: d

Watch Video Solution

105. When the equation below is balanced correctly using the simplest whole number coefficients, what is the coefficient for $CO_2(g)$?

$$\_\_Cr_2O_7^{2-}(aq) + \quad \_\_H_2C_2O_4(aq) + \_\_H_2O(l) \rightarrow \_\_Cr^{3+}(aq) + \_\_ CO_2(g) + \_\_H_2O(l)$$

A. 4

B. 6

C. 8

D. 12

Answer: b

Watch Video Solution

106. How many H^+ ions are required when the equation below is balanced with the smallest whole number coefficients?

$$Cu(s) + NO +_3^- \text{ (aq)} + H^+ \text{ (aq)} \rightarrow Cu^{2+} \text{ (aq)} + NO(g) + H_2O(l)$$

A. 2

B. 4

C. 6

D. 8

Answer: d

Watch Video Solution

107. When this equation is balanced using the smallest possible integers, what is the sum of the coefficients?

$$\_(NH_4)_3PO_4(aq) + \_CaCl_2(aq) \rightarrow \_Ca_3(PO_4)_2(s) + \_NH_4 \text{ (aq)}$$

A. 8

B. 9

C. 11

D. 12

Answer: d

Watch Video Solution

108. Born carbide, B_4C, is made by the high temperature reaction of boron oxide with graphite, yielding carbon monoxide as a by-product

$$\_\_\_B_2O_3 + \_\_\_\_C \rightarrow \_\_\_\_\_B_4C + CO$$

What is the total of the smallest coefficients for the reactants and and products in the balanced equation?

A. 9

B. 10

C. 15

D. 16

Answer: d

Watch Video Solution

109. When the equation

$$\_\_\_\_\_MnO_4^- + \_\_SO_3^{2-} + \_\_\_\_\_H^+ \rightarrow \_\_\_\_\_Mn^{2+} + \_\_\_\_\_SO_4^{2-} + \_\_\_\_\_H_2O$$

is balanced correctly with the smallest whole number coefficients, what is the coefficient for H_2O?

A. 3

B. 5

C. 8

D. 10

Answer: a

Watch Video Solution

110. What is the coefficients of I_2 (s) when the reaction below is balanced with smallest whole number coefficients?

$$Cr_2O_7^{2-}(aq) + \_\_\_\_.^{-}(aq) + \_\_\_\_H^{+}(aq) \rightarrow \_\_\_\_\_I_2(s) + \_\_\_Cr^{3+}(aq)$$

A. 2

B. 3

C. 4

D. 6

Answer: b

Watch Video Solution

111. The following redox reaction occurs in basic medium $NO_3^- Zn(s) \rightarrow Zn^{2+} + NH_4^+$ when the above reaction is balanced such that the stoichiometric coefficients are in smallest whole number

ratio, then the difference of stoichiometric coefficient of Zn (s) and OH^- ion will be:

A. 4

B. 10

C. 6

D. None of these

Answer: c

Watch Video Solution

112. Ratio of stoichiometric coefficient of N_2H_4 to Cl^- in the following reaction:

$$ClO_3^- + N_2H_4 \rightarrow NO_3^- + Cl^-$$

A. $\frac{8}{15}$

B. 1

C. $\frac{2}{3}$

D. $\frac{6}{14}$

Answer: d

Watch Video Solution

113. What is the atomic mass of a metal whose specific heat capaity $\frac{1}{9}$ cal/ gm° C and whose percentage by mass in its superoxide is 36%?

A. 57.6

B. 54

C. 36

D. 64

Answer: a

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114. Equivalent weight of Br_2 in the following reaction is

$Br_2 + HgO + H_2O \rightarrow HgBr_2.HgO + HBrO$

(given $Br = 80$)

A. $\frac{160}{3}$

B. 80

C. 160

D. 160×3

Answer: c

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115. In the reaction

$2CuSO_4 + 4KI \rightarrow 2Cu_2I_2 + I_2 + 2K_2SO_4$ the equivalent weight of $CuSO_4$ will be:

A. 31.75

B. 63.5

C. 127

D. 15.88

Answer: b

Watch Video Solution

116. In the following reaction hydrazine is oxidized N_2

$N_2H_4 + OH^- \rightarrow N_2 + H_2O + e$ The equivalent weight of N_2H_4 (hydrazine) is:

A. 8

B. 16

C. 32

D. 64

Answer: a

Watch Video Solution

117. Determine the equivalent weight of each given below, if formula weight of these compounds are X, Y and Z respectively:

(i) Na_2SO_4, (ii) $Na_3PO_4.12H_2O$

(iii) $Ca_3(PO_4)_2$

A. (I). $\frac{X}{2}$

(II). $\frac{Y}{3}$

(III). $\frac{Z}{6}$

B. $(I).\ X$

(II). $\frac{Y}{3}$

(III) $\frac{Z}{3}$

C. (I) $\frac{X}{2}$

(II). $\frac{Z}{3}$

(III). $\frac{Z}{3}$

D. `(I)X,(II) Y,(III)Z

Answer: a

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118. When one mole NO_3^- is converted into 1 mole NO_2 0.5 mole N_2 and 0.5 mole N_2O respectively,

accepts x,y and z mole of reaction -x,y,z are respectively.

A. 1,5,4

B. 1,2,3

C. 2,1,3

D. 2,3,4

Answer: a

Watch Video Solution

119. In the equation,

$SnCl_2 + 2HgCl_2 \rightarrow HgCl_2 + SnCl_4$

The equivalent weight of stannous schloride (molecular weight $= 190$) will be :

A. 190

B. 95

C. 47.5

D. 154.5

Answer: b

Watch Video Solution

120. In the following reaction:

$3Fe + 4H_2O \rightarrow Fe_3O_4 + 4H_2$, if the atomic weight of iron is 56, then its equivalent weight will be

A. 42

B. 21

C. 63

D. 84

Answer: b

Watch Video Solution

121. Which of the following statements is corrected about equivalent weight of $KMnO_4$?

A. Equivalent weight is $\frac{1}{3}$ of molecular mass in neutral and weak basic medium

B. Equivalent weight is $\frac{1}{5}$ of molecular mass in basic medium

C. Equivalent weight is equal to molecular mass in acidic medium

D. Equivalent weight is $\frac{1}{3}$ of molecular mass in acidic medium

Answer: a

Watch Video Solution

122. Equivalent weight of NH_3 in the change

$N_2 \rightarrow NH_3$ is :

A. $\frac{17}{6}$

B. 17

C. $\frac{17}{2}$

D. $\frac{17}{3}$

Answer: d

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123. If M represents molecular mass of Mn_3O_2 then what will be its equivalent mass if it undergoes disproportionation reaction as shown:

$Mn_3O_4 \rightarrow Mn_4^- + Mn^{2+}$

A. $\frac{M}{13}$

B. $\frac{M}{2}$

C. $\frac{15M}{26}$

D. $\frac{26M}{15}$

Answer: c

Watch Video Solution

124. What is the equivalent mass of $S_2O_3^{2-}$ ion as par the following disproportionation reaction.

$S_2O_3^{2-} \rightarrow S_4O_6^{2-} + S_2^{2-}$

Where the charge above species represents charge on the ion and not oxidation state?

A. 132

B. 22

C. 130.6

D. 113.15

Answer: c

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125. The equivalent mass of $MnSO_4$ is half its molecular mass when it is converted to

A. Mn_2O_3

B. MnO_2

C. MnO_4^-

D. MnO_4^{2-}

Answer: b

Watch Video Solution

126. When $KMnO_4$ acts as an oxidising agnet and ultimetely from MnO_4^{2-}, MnO_2, Mn_2O_3, and Mn^{2+}, then the number of electrons transferred in each case, respectively, are

A. 4, 3, 1, 5

B. 1, 5, 3, 7

C. 1, 3, 4, 5

D. 3, 5, 7, 1

Answer: c

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127. Equivalent weight of chlorine molecule in the equation is :

$3Cl_2 + 6NaOH \rightarrow 5NaCl + NaClO_3 + 3H_2O$

A. 42.6

B. 35.5

C. 59.1

D. 71

Answer: a

Watch Video Solution

128. In the reaction: $Na_2S_2O_3 + 4Cl_2 + 5H_2O \rightarrow Na_2SO_4 + H_2SO_4 + 8HCl$, the equivalent weight of $Na_2S_2O_3$ will be: (M= molecular weight of $Na_2S_2O_3$)

A. $\frac{M}{4}$

B. $\frac{M}{8}$

C. $\frac{M}{1}$

D. $\frac{M}{2}$

Answer: b

Watch Video Solution

129. X gm of metal gave Y gm of its oxide, so equivalent mass of metal is :

A. $\left(\frac{X}{Y-X}\right) \times 8$

B. $\left(\frac{Y-X}{X}\right) \times 8$

C. $\left(\frac{Y+X}{X}\right) \times 8$

D. $\frac{X}{Y} \times 8$

Answer: a

Watch Video Solution

130. In the following conversion of sulphide of phosphorous

$P_4S_3 \rightarrow P_2O_5 + SO_2$

Equivalent weight of P_4S_3 (molecular weight=M) is :

A. $\frac{M}{14}$

B. $\frac{M}{18}$

C. $\frac{M}{32}$

D. $\frac{M}{38}$

Answer: c

Watch Video Solution

131.

$$\left[Co(H_2N-CHCH_2\_NH_2)_3\right]_2S_3 \xrightarrow{\text{oxidation}} Co^{+4} + CO_3^{-2} + NO_3^- + SO$$

What is the equivalent weight of the reactant in the avobe reaction?

A. $\frac{3M}{182}$

B. $\frac{M}{182}$

C. $\frac{11M}{182}$

D. $\frac{7M}{182}$

Answer: b

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132. 3.65gm equimole mixture of $NaOH$ and Na_2CO_3 is titrated against $0.1MHCl$ using phenolphathalein as an indicator, V_1mL of acid was required to reach end point. In another experiment $3.65gm$ of same mixture is titrated against 0.2M HCl using methyl orange as an indicator, V_2mL of acid was required to reach end point. $V_1 + V_2$ is :

A. 875mL

B. 750mL

C. 500mL

D. 1000mL

Answer: a

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133. How may millilitres of a $9NH_2SO_4$ solution will be required to neutralize completely $20mL$ of a $3.6NNaOH$ solution ?

A. $18.0mL$

B. $8.0mL$

C. $16.0mL$

D. $80.0mL$

Answer: b

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134. What is the normality of the H_2SO_4 solution, 18.6mL $ofwhich \neq utralizes$30.0mLofa1.55NKOH` solution

A. 5.0N

B. 1.25N

C. 2.5N

D. 3.5N

Answer: c

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135. 50ml of $5.6\%\ KOH$ (w/v) os added to 50mL of a $5.6\%\ HCl$ (w/n) solution. The resulting solution will be :

A. neutral

B. alkaline

C. strongly alkaline

D. acidic

Answer: d

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136. Calulate the normality of an $NaOH$ solution, 21.5mL of which is required $0.240g$ of NaH_2PO_4 in a solution to monohydrogen phosphate.

A. 1.093N

B. 0.093N

C. 0.048N

D. 0.93N

Answer: b

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137. 2.00g of a mixture of $NaHCO_3$ and $KClO_3$ present in the mixture is :

A. 0.84g

B. 1.84g

C. 1.16g

D. 0.16g

Answer: c

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138. A 25mL HCl solution containing 3.65g HCl/L is neutralized by 50mL of NaOH solution. Again, 25mL of an H_2SO_4 solution of unknow strenght. The normally of the H_2SO_4 solution is :

A. 0.25N

B. 0.025N

C. 0.05N

D. 0.05N

Answer: b

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139. 10mL of 0.5NHCl, 30mL of $0.1NHNO_3$ and 75mL of 0.1M H_2SO_4 are mixed together. The normality of the resulting solution will be :

A. 0.2N

B. 0.1N

C. 0.4N

D. 0.5N

Answer: a

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140. The amount of $KMnO_4$ required to prepare 100mL of a $0.1N$ solution in an acidic medium is :

A. 3.16g

B. 1.58g

C. 0.316g

D. 31.6g

Answer: c

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141. 0,185g of an iron wire containing 99.8% iron is dissolved in an acid to from ferrous ions. The solution requires 33mL of $K_2Cr_2O_7$ solution for complete reaction. The normality of the $K_2Cr_2O_7$ solution is :

A. 0.05

B. 0.20

C. 0.02

D. 0.10

Answer: d

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142. 8.7gm of pyrolusite (impure MmO_2) were heated with concentrated HCl. The Cl_2 gas evolved was passed through excess of KI solution. The iodine gas evolved required 80ml of $\frac{N}{10}$ hypo solution.

The precentage of MnO_2 in pyrolusite will be : $[Mn = 55]$

A. 0.04

B. 0.4

C. 0.08

D. 0.8

Answer: a

Watch Video Solution

143. Volume of 0.1M ferrous oxalate solution required to react completely with 60ml of 0.1N acidified $KMnO_4$ solution

A. 30mL

B. 20mL

C. 150mL

D. 10mL

Answer: b

Watch Video Solution

144. An equimolar mixture of $Na_2C_2O_4$ and $KHC_2O_43H_2C_2O_4$ required V_1 litre of $0.1MKMnO_4$ ion acidic medium for complete oxidation. The same amount of mixture required V_2 litre of $0.2MNaOH$ for complete neutralization. What os the ratio of $V_1 : V_2$?

A. $4:7$

B. $10:7$

C. $8:7$

D. $2:7$

Answer: a

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145. What volume of $O_2(g)$ measured at 1 atm and 273K will be formed buy action of 200mL of $0.4MKMnO_4$ of hydrogen peroxide in acidic solution /

A. 4.48 litre

B. 2.24 litre

C. 8.96 litre

D. 1.12 litre

Answer: a

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146. 10 moles of $KMnO_4$ were consumed in each separate titration with oxalic acid, one in presence of H_2SO_4 and other in presence of HCl. Identify the correct option.

A. 25 moles of oxalic acid will be consumed in both cases.

B. 25 moles of oxalic acid will be consumed in with H_2SO_4 and with HCl more than 25 moles of oxalic acid will be consumed.

C. No oxalic acid will be consumed in case of HCl and less than 25 moles will be consumed in case of H_2SO_4

D. 25 moles of oxalic acid will be consumed with H_2SO_4 and less than 25 moles of oxalic acid will be consumed with HCl

Answer: d

Watch Video Solution

147. 100mL each of $1NH_2O_2$ and $11.2VH_2O_2$ solution are mixed, then the final solution is equivalent to:

(Assume 1 mole od an ideal gas occupies 22.4L at STP)

A. $3MH_2O_2$ solution

B. $0.5NH_2O_2$ solution

C. $34g / LH_2O_2$ solution

D. $2.55g / LH_2O_2$ solution

Answer: c

Watch Video Solution

148. The CO in a 20.3L sample of gas was converted to CO_2 by passing the gas over iodine pentoxide heated to $150^\circ C$:

$I_2O_5(s) + 5CO(g) \rightarrow 5CO_2(g) + I_2(g)$

The iodine distilled at this temperature and was collected in an absorber containing 8.25mL of $0.11101MNa_2S_2O_3$. The excess hypo was back-titrated with $2.16mL$ of $0.00947MI_2$ solution. The milligrams of CO in $1L$ of the original gas sample was therefore:

A. $0.\ 172mg$

B. $0.283mg$

C. $0.349mg$

D. $0.506mg$

Answer: a

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149. Bleaching powder and bleach solution are produced on a large scale and used in several hous-hold products. The effectiveness of bleach solution id often measured by iodometry.

$25mL$ of household bleach solution was mixed with $30mL$ of $0.50MKI$ and $10mL$ of $4N$ acetic acid. In the titration of the liberated iodine, $48mL$ of $0.25NNa_2S_2O_3$ was used to reach the end point. The molarity of the household bleach solution is :

A. 0.48M

B. 0.96M

C. 0.24M

D. 0.024M

Answer: c

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150. The number of moles of oxalate ions oxidised by one mole of MnO_4^- ion in acidic medium is :

A. $\frac{5}{2}$

B. $\frac{2}{5}$

C. $\frac{3}{5}$

D. $\frac{5}{3}$

Answer: d

Watch Video Solution

151. How many moles of $KMnO_4$ are needed to oxidise a mixture of 1 mole of each $FeSO_4 \& FeC_2O_4$ in acidic medium :

A. $\frac{4}{5}$

B. $\frac{5}{4}$

C. $\frac{3}{4}$

D. $\frac{5}{3}$

Answer: a

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152. An aqueous solution containing 0.10 g KIO_3 (formula weight $= 214.0$) was treated with an excess of KI solution the solution was acidified with HCl. The liberated I_2 consumed 45.0 " mL of " thiosulphate solution to decolourise the blue starch-iodine complex. Calculate the molarity of the sodium thosulphate solution.

A. 0.0623M

B. 0.0313M

C. 0.126M

D. 0.252M

Answer: a

Watch Video Solution

153. When N_2 is converted into NH_3, the equivalent weight of nitrogen will be:

A. 1.67

B. 2.67

C. 2.63

D. 4.67

Answer: d

Watch Video Solution

154. In the conversion $NH_2OH \rightarrow N_2O$, the equivalent weight of NH_2OH will be:

A. $\frac{M}{4}$

B. $\frac{M}{2}$

C. $\frac{M}{5}$

D. $\frac{M}{1}$

Answer: b

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155. Which of the following relations is incorrect for solutions?

A. $3NAl_2(SO_4)_3 = 0.5MAl_2(SO_4)_3$

B. $3MH_2SO_4 = 6NH_2SO_4$

C. $1MH_3PO_4 = 1/3NH_3PO_4$

D. $1MAl_2(SO_4)_3 + 6NAl_2(SO_4)_3$

Answer: c

Watch Video Solution

156. How many millilitres of complete reaction with a solution containing $0.125g$ of pure Na_2CO_3 :

A. $23.6mL$

B. $25.6mL$

C. $26.3mL$

D. $32.6mL$

Answer: a

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157. If 25mL of a H_2SO_4 solution reacts completely with $1.06g$ of pure Na_2CO_3 , what is the normality of this acid sotution :

A. 1N

B. 0.5N

C. 1.8N

D. 0.8N

Answer: d

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158. The mass of oxalic acid crystals $(H_2C_2O_4.2H_2O)$ required to prepare 50 mL of a 0.2 N solution is:

A. 4.5g

B. 6.3g

C. 0.63g

D. 0.45g

Answer: c

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159. 125mL of 63% (w/v) $H_2C_2O_4.2H_2O$ solution is made to react with 125mL of a 40% (w/v) $NaOH$ solution. The resulting solution is : (ignoring hydrolysis of ions)

A. neutral

B. acidic

C. strongly acidic

D. alkaline

Answer: a

Watch Video Solution

160. A certain weioght of pure $CaCO_3$ is made to react completely with 200mL of a HCl solution to given 227mL of CO_2 gas at STP. The notmality of the HCl` solution is :

A. $0.05N$

B. $0.1N$

C. $1.0N$

D. $0.2N$

Answer: b

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161. Volume $V_1 mL$ of 0.1 M $K_2Cr_2O_7$ is needed for complete oxidation of 0.678g N_2H_4 in acidic medium. The volume of 0.3M $KMnO_4$ needed for same oxidation in acidic medium will be :

A. $\frac{2}{5}V_1$

B. $\frac{5}{2}V_1$

C. $113VV_1$

D. can not be determind

Answer: a

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162. Which of the following solutions will exactly oxidize $25mL$ of an acid solution of $0.1MFe\ (II)$ oxalate?

A. $25mL$ of $0.1MKMnO_4$

B. $25mL$ of $0.2MKMnO_4$

C. $25mL$ of $0.6MKMnO_4$

D. $15mL$ of $0.1MKMnO_4$

Answer: d

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163. An element A in a compound ABD has oxidation number A^{n-}. It is oxidised by $Cr_2O_7^{2-}$ in acid medium. In the experiment 1.68×10^{-3}

moles of $K_2Cr_2O_7$ were used for 3.26×10^{-3} moles of ABD. The new oxidation number of A after oxidation is:

A. 3

B. 3-n

C. n-3

D. $+n$

Answer: b

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164. A mixture of 0.02 mole of $KBrO_3$ and 0.001 mole of KBr was treated with excess of KI and acidified. The volume of 0.01M $Na_2S_2O_3$ solution required to consume the liberated iodine will be :

A. 1000mL

B. 1200mL

C. 1500mL

D. 800mL

Answer: b

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165. $Hg_5(IO_6)_2$ oxidizes KI to I_2 in acid medium and the other product containing iodine is K_2HgI_4 . If the I_2 liberated in the number of moles of $Hg_5(IO_6)_2$ that have reacted is :

A. 10^{-3}

B. 10^{-4}

C. 2.5×10^{-4}

D. 2.5×10^{-2}

Answer: c

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166. The normality of $0.3M$ phosphorous acid H_3PO_3 is:

A. 0.1

B. 0.9

C. 0.3

D. 0.6

Answer: d

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167. An aqueous solution of $6.3g$ oxalic acid dihydrate is made up to $250mL$. The volume of $0.1NNaOH$ required to completely neutralise $10mL$ of this solution is

A. 40mL

B. 20mL

C. 10mL

D. 4mL

Answer: a

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168. When I^{Θ} is oxidised by MnO_4^{Θ} in an alkaine medium, I^{Θ} converts into

A. IO_3^-

B. I_2

C. IO_4^-

D. IO^-

Answer: a

Watch Video Solution

169. The amount of wet NaOH containing 15% water required to prepare 70 liters of 0.5 N solution is:

A. $1.65kg$

B. $1.4kg$

C. $16.5kg$

D. $140kg$

Answer: a

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170. $50mL$ of $0.1M$ solution of a salt reacted with $25mL$ of $0.1M$ solution of sodium sulphite. The half reaction for the oxidation of sulphite ion is:

$SO_3^{2-}(aq) + H_2O(l) \rightarrow (aq) + 2H^+(aq) + 2e^-$

If the oxidation number of metal in the salt was 3, what would be the new oxidation number of metal:

A. 0

B. 1

C. 2

D. 4

Answer: c

Watch Video Solution

171. HNO_3 oxidies NH_4^+ ions to nitrogen and itself gets reduced to NO_2. The moles of HNO_3 required by 1 mole of $(NH_4)_2SO_4$ is:

A. 4

B. 5

C. 6

D. 2

Answer: c

Watch Video Solution

172. $25ml$ of a $0.1(M)$ solution of a stable cation of transition metal z reacts exactly with $25ml$ of $0.04(M)$ acidified $KMnO_4$ solution. Which of the following is most likely to represent the change in oxidation state of Z correctly?

A. $Z^+ \rightarrow Z^{2+}$

B. $Z^{2+} \rightarrow Z^{3+}$

C. $Z^{3+} \rightarrow Z^{4+}$

D. $Z^{2+} \rightarrow Z^{4+}$

Answer: d

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173. How many litres of Cl_2 at STP will be liberated by the oxidation of $NaCl$ with $10gKMnO_4$ in acidic medium: (Atomic weight:

$Mn = 55$ and $K = 39$)

A. 3.59

B. 7.08

C. 1.77

D. None of these

Answer: a

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174. One gram of Na_3AsO_4 is boiled with excess of solid KI in presence of strong HCl. The iodine evolved is absorbed in KI solution and titrated against $0.2N$ hyposolution. Assuming the reaction to be

$AsO_4^{3-} + 2H^+ + 2I^- \rightarrow AsO_3^{2-} + H_2O + I_2$,

calculate the volume of arsenate consumed. [Atomic weight of $As = 75$]

A. 48.1mL

B. 38.4mL

C. 24.7mL

D. 30.3mL

Answer: a

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175. What happen when a solution of potassium chromate is treated with an excess of dil. Nitic acid?

A. Cr reduces in the oxidation state $+3$ from CrO_4^{-2}

B. Cr oxidies in the oxidation state $+7$ from CrO_4^{2-}

C. Cr^{+3} and $Cr_2O_7^{2-}$ will be formed

D. $Cr_2O_7^{2-}$ and H_2O will be formed

Answer: d

Watch Video Solution

176. The oxidation state of chrominium in the final product formed in the reaction between KI and acidified potassium dichromate soluttion is

A. $+4$

B. $+6$

C. $+2$

D. $+3$

Answer: d

Watch Video Solution

177. Consider a titration of potassium dichromate solution with acidified Mohr's salt solution using diphenylamine as indicator. The number of moles of Mohr's salt required per mole of dichromate is:

A. 3

B. 4

C. 5

D. 6

Answer: d

Watch Video Solution

178. Dichloroacetic acid $(CHCI_2COOH)$ is oxidised to CO_2, H_2O and CI_2 by 600meq of an oxidising agent. Same amount of ammonia to form ammonium dichloroacetate:

A. 0.0167

B. 0.1

C. 0.3

D. 0.6

Answer: b

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179. $20mlofH_2O_2$ after acidification with dilute H_2SO_4required 30mlof $\frac{N}{12}KMnO_4$ for complete oxidation. The approximate strength of H_2O_2 solution (ing/L)is : [Molar mass of $H_2O_2 = 34$]

A. $2g/L$

B. $4g/L$

C. $8g/L$

D. $6g/L$

Answer: a

Watch Video Solution

180. What will be the volume strength of 100mL of $KMnO_4$ in acidic medium? (Given that 61mL of $KMnO_4$ reacts completely with 5mL of $1MK_4\left[Fe(CN)_6\right]$ where it converts into K^+, Fe^{3+}, CO_3^{2-} and NO_3^-)

A. 17.31 V

B. 34.62 V

C. 18.8 V

D. 19.8 V

Answer: a

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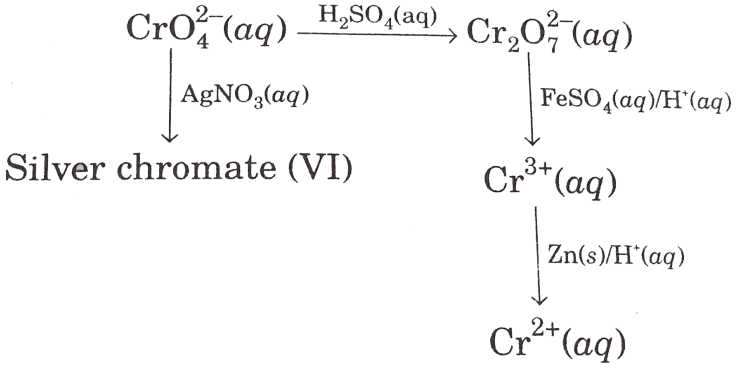
181. Consider the reactions shown below :



Which of the follwoing statements is false?

A. Silver chromate (VI) has the formula Ag_2CrO_4.

B. The minimum mass of zinc required to reduce 0.1 mole of Cr^{3+} to Cr^{2+} is 6.54g

C. The conversion of CrO_4^{2-} into $Cr_2O_7^{2-}$ is not a redox reaction .

D. The equation $Cr_2O_7^{2-} + 14H^+ 6Fe^{2+} \rightarrow 6Fe^{3+} + 2Cr^{3+} + 7H_2O$ correctly describes the reduction of $Cr_2O_7^{2-}$ by acidified $FeSO_4$.

Answer: b

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182. 0.7g of $(NH_4)_2SO_4$ sample was boiled with 100mL of 0.2 N NaOH solution was diluted to 250 ml. 25mL of this solution was neutralised using 10mL of a 0.1 N H_2SO_4 solution. The percentage purity of the $(NH_4)_2SO_4$ sample is :

A. 94.3

B. 50.8

C. 47.4

D. 79.8

Answer: a

Watch Video Solution

183. A mixutre solution of KOH and Na_2CO_3 requires 15 " mL of " $\frac{N}{20}$ HCl when titrated with phenolphthalein as indicator.But the same amoound of the solutions when titrated with methyl orange as indicator requires 25 " mL of " the same acid. Calculate the amount of KOH and Na_2CO_3 present in the solution.

A. 0.014g

B. 0.14g

C. 0.028g

D. 1.4g

Answer: a

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184. The percentage of copper in copper (II) salt can be determined by using a thisulphate titration. A $0.305g$ of copper (II) salt was dissolved in water and added to an excess of potassium iodide solution liberating iodine according to the following equation:

$2Cu^{2+}(aq) + 4I^{-}(aq) \rightarrow 2C\underline{s} + I_2(aq)$ The iodine liberated required $24.5cm^3$ of a 0.1 mole dm^{-3}solution of sodium thiosulphate for titration according to reaction:

$2S_2O_3^{2-} + I_2(aq) + S_4O_6^{2-}(aq)$

The percentage of copper by mass in the copper (II) salt is (Atomic mass of copper =63.5)

A. 64.2

B. 51

C. 48.4

D. 25.5

Answer: b

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185. When the permanganate ion, MnO_4^- ,acts as an oxidizing agent it forms different products depending on the Ph of the solution. Which species correspond to the conditions listed?

	Acidic	Basic	Neutral
A	Mn^{2+}	$Mn(OH)_2$	MnO_2
B	Mn^{2+}	MnO_4^{2-}	MnO_2
C	MnO_2	MnO_4^{2-}	$Mn(OH)_2$
D	Mn^{2+}	$Mn(OH)_2$	MnO_4^{2-}

A. A

B. B

C. C

D. D

Answer: b

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186. 10 mL of 1 NHCl is mixed with 20 mL of $1MH_2SO_4$ and 30 mL of 1M NaOH. The resultant solution has:

A. 20meqof H^+ ions

B. 20meq of OH^-

C. 0meq of H^+ or OH^-

D. 30 mili moles of H^+

Answer: a

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187. Which of the followjng statements are incorrect ?

A. 0.2 moles of $KMnO_4$ will oxide one mole of ferrous ions ferric ions in acidic medium.

B. 1.5 moles of $KMnO_4$ will oxidise 1 mole of ferrous oxalate in acidic medium.

C. 0.6 moles $KMnO_4$ will oxidise 1 mole of ferrous oxalate to one mole of ferric ion and carbon dioxide in acidic medium.

D. 1 mole of $K_2Cr_2O_7$ will oxidise 2 moles of ferrous oxalate to ferric ions and carbon dioxide in acidic medium.

Answer: b

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188. H_2O_2 acts as both oxidising and reducing agent. As oxidising agent, its product is H_2O but as redusing agent, its product is O_2. Volume strength has great significance for chemical reactions. The strength of '10 V means 1 volume (or litre) of H_2O_2 on decomposition

$\left(H_2O_2 \rightarrow H_2O + \frac{1}{2}O_2\right)$ gives 10 volumes (or litre) of oxygen at NTP.

$15gBa(MnO_4)_2$ sample containing inert impurity is completely reacting with 100 mL of '11.2 V' H_2O_2, then what will be the $\%$ purity of $Ba(MnO_4)_2$ in the sample: (Atomic mass: $Ba = 137, Mn = 55$)

A. $5\ \%$

B. $10\ \%$

C. $50\ \%$

D. None of these

Answer: c

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189. 1.2g of carbon is burnt completely in oxygen (limted supply) to produce CO and CO_2 . This mixture of gases is treated with solid I_2O_5 (to know the amount of CO produced). The librated iodine required 120 ml of 0.1m hypo solution for complete titration. The percentage carbon converted into CO is :

A. $70\ \%$

B. $100\ \%$

C. $50\ \%$

D. $30\ \%$

Answer: a

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190. The valency factor of I_2 when, (i) it is formed by the reaction of potassium iodide and potassium iodate in acid medium and (ii) when it reacts with hypo, are respectively:

A. $2, 2$

B. $\frac{5}{3}, 2$

C. $\frac{3}{5}, 2$

D. $5, 2$

Answer: b

Watch Video Solution

191. x gram of pure As_2S_3 is completely oxididsed to respective highest oxidation states by 50 ml of 0.1 M hot acidified $KMnO_4$, then mass of As_2S_3 taken is :

A. $22.4g$

B. $43.92g$

C. $64.23g$

D. None of these

Answer: d

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192. The number of moles of oxalate ions oxidised by one mole of MnO_4^- ion in acidic medium is :

A. $\frac{5}{2}$

B. $\frac{2}{5}$

C. $\frac{3}{5}$

D. $\frac{5}{3}$

Answer: a

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193. What volume of 0.1M H_2O_2 solution will be required to completely reduce 1 litre of 0.1 M $KMnO_4$ in acidic medium?

A. 2500ml

B. 500ml

C. 1000ml

D. 1200ml

Answer: a

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194. Calculate the number of millimoles of SO_2 if in the reaction,10mL of 0.1M $KMnO_4$ solution are required for complete titration.

$SO_2 + MnO_4^- \rightarrow SO_4^- + Mn^{+2}$

A. 2.5

B. 0.5

C. 1.25

D. None of these

Answer: a

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195. 10 moles of ferric oxalate is oxidised by x mole of MnO_4^- in acidic medium. The value of 'x' is :

A. 12

B. 4

C. 40

D. 18

Answer: a

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196. In iodometric estimation of Cu^{2+} ion, the following reaction took place

$2Cu^{2+} + 4I \rightarrow Cu_2I_2 + I_2$

$I_2 + 2Na_2S_2O_3 \rightarrow 2NaI + Na_2S_4O_6$

If 100mL OF $CuSO_4$ solution added to excess KI requires 50mL of 0.2M Na, S_2O_3 the molarity of $CuSO_4$ solution is :

A. $0.05M$

B. $0.1M$

C. $0.2M$

D. $0.25M$

Answer: b

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197. Calculate the moles of $KMnO_4$ required to react completely with 2 m and 1500 mL of $K_2C_2O_4H_2C_2O_4$ in acidic medium.

A. 0.8

B. 0.6

C. 1.6

D. 2.4

Answer: d

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198. $4:3$ gm of an alkane is burnt in sufficient oxygen. The CO_2 formed reacts cmpletely with 300mL , 2N NaOH solution producing Na_2CO_3. The alkane should be :

A. C_3H_8

B. $C_{12}H_{26}$

C. C_6H_{14}

D. C_2H_6

Answer: c

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199. What is the correct relation between normality (N) and molarity (M) of $K_2Cr_2O_7$ acting as oxidising agent in acidic medium?

A. M=6N

B. N=3M

C. M=3N

D.

Answer: a

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200. Number of moles of electorns in the reaction during formation of 1 mole of Fe_3O_4 according to the reaction $Fe + H_2O \rightarrow Fe_3O_4 + H_2$ will be :

A. 1

B. 5

C. 3

D. 8

Answer: d

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201. 25 ml of $\frac{N}{10}$ caustic soda solution exactly neuralised 20ml of an acid solution contaning $7.875gm$ of acid per litre. What will be the equivalent mass of acid?

A. 63

B. 126

C. 26

D. 25

Answer: a

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202. 10mL of H_2O solution weighs 10 gm. The solution is diluted to 250mL. 25mL of this diluted solution required 40 mL of a M/50 solution of $KMnO_4$. Then, volume Strenght of original H_2O_2, solution is :

Given:

$$5H_2O_2 + 2KMnO_4 + 6HCl \rightarrow 2KCl + 2MnCl_2 + 5O_2 + 8H_2O$$

A. 22.7V

B. 11.35V

C. 45.4V

D. 2.27V

Answer: a

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203. 0.8 M $FeSO_4$ solution requires 160mL,0.2 M $Al_2(Cr_2O_7)_3$ in acidic medium. Calculate volume of $FeSO_4$ consumed :

A. 480mL

B. 240mL

C. 720mL

D. 40mL

Answer: c

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204. If valence factor (n-factor) of compound $NaHC_2O_4.2H_2C_2O_4.3K_2C_2O_4.4Al_2(C_2O_4)_3.3FeC_2O_4$ in acid base titration is x and redox titration with $KMnO_4$ is y then value of y/x is:

A. 8.4

B. 9

C. 11.25

D. 12

Answer: b

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205. In alkaline medium, ClO_2 oxidises $H_2O_2 \text{to} O_2$ and is itself reduced to $Cl^{\ominus}$. How many moles of H_2O_2 are oxidised by $1 \text{mol of } ClO_2$?

A. 1

B. 1.5

C. 2.5

D. 3.5

Answer: c

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206. If equal volume of 1M $KMnO_4$ and 1M$K_2Cr_2O_7$ solution are used to react with Fe^{2+} oxidized will be :

A. more by $K_2Cr_2O_7$

B. more by $KMnO_4$

C. equal in both cases

D. Fe^{2+} cannot be oxidized

Answer: a

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207. In a titration of H_2O_2 certain amount is treated with 'y' mole of $KMnO_4$ in acidic medium. The mole of H_2O_2 in solution will be :

A. 3y

B. $\frac{5y}{2}$

C. 5y

D. 2y

Answer: b

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208. $5mL$ of $N-HCl$, $20mL$ of $N/2H_2SO_4$ and $30mL$ of $N/3\ HNO_3$ are mixed together and the volume is made to $1L$. The normality of the resulting solution is

A. 1gm

B. 0.5gm

C. 0.1gm

D. 21.8gm

Answer: d

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209. In basic medium CrO_4^{2-} reacts with $S_2O_3^{2-}$ resulting in the formation of $Cr(OH)_4^{\ominus}$ and SO_4^{2-} How many " mL of " 0.1 M Na_2CrO_4 is required to react with 40 " mL of " 0.25 M $Na_2S_2O_3$?

A. 16mL

B. 32mL

C. 128mL

D. 42mL

Answer: c

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210. What is the molarity of H_2O_2 solution whose 100mL produce the 0.5 moles of I_2, when reacted with excess KI solution?

A. 0.5M

B. 1M

C. 2.5M

D. 5M

Answer: d

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211. Moles of $K_2Cr_2O_7$ used to oxidise 1 mol $Fe_{0.92}O$ to Fe^{3+} are :

A. $\frac{0.92}{6}$

B. $\frac{70}{92} \times \frac{1}{6}$

C. $\frac{0.76}{6}$

D. $\frac{70}{92} \times \frac{1}{3}$

Answer: c

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212. In a titration certain amount of H_2O_2 is treated with y mole of $KMnO_4$ in acidic medium. The left out $KMnO_4$ when treated with X^+ in basic medium oxidizes X^{+1} to X^{+6} and 0.2 M, x L of X^+ was consumed. The mole of given H_2O_2 solution is :

A. $\frac{y-x}{5}$

B. $5\left(\frac{y-x}{2}\right)$

C. $\frac{(5y-x)}{10}$

D. $\frac{(5y-x)}{5}$

Answer: b

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213. x m mol of KIO_3 reacts completely with y m mol of KI to give I_2 quantitavely. If z m mol of hypo are required for complete titration against this I_2 , then, which statement is incorrect?

A. z=6x

B. 6y=5z

C. 5x=y

D. x+y=2z

Answer: d

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214. In basic medium, CrO_4^{2-} oxidises $S_2O_3^{2-}$ to form SO_4^{2-} and itself changes to $Cr(OH)_4^-$. How many mL of 0.154M CrO_4^{2-} are required to react with 40mL of 0.308 M $S_2O_3^{2-}$?

A. 213mL

B. 156.4mL

C. 170.4mL

D. 190.4mL

Answer: a

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215. What would be the normality of a 0.1 M $K_2Cr_2O_7$ solution used as a oxidizing agent of Pb^(2+)?

A. 0.1N

B. 0.6N

C. 0.4N

D. 0.2N

Answer: b

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216. A solution of 0.4 g sample of H_2O_2 reacted with 0.632 g of $KMnO_4$ in presence of sulphuric acid. The percentage purity of the sample of H_2O_2 is :

A. 0.95

B. 0.85

C. 0.8

D. none of these

Answer: b

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217. $0.3g$ of an oxalate salts was dissolved in $100mL$ solution. The solution required $90mL$ of $N/20KMnO_4$ for complete oxidation. The $\%$ of oxalate ion in salt is:

A. 0.33

B. 0.66

C. 0.7

D. 0.4

Answer: b

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218. In the redox reaction,

$$2MnO_4^- + 5C_2O_4^{2-} + 16H^+ \rightarrow 2Mn^{2+} + 10CO_2 + 8H_2O$$

20mL of 0.1 M $KMnO_4$ reacts quantitatively with :

A. 20mL of 0.1 M oxalate

B. 40mL of 0.1 M oxalate

C. 50ml of 0.25 M oxalate

D. 50mL of 0.1 M oxalate

Answer: d

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219. 4-amino-3-methylbutanoic acid is treated with thionyl chloride followed by ammonia to obtain compound X. X on reaction with, bromine in an alkaline medium gave compound Y. For estimation, Y was titrated

with perchloric acid. The volume of 0.1 M perchloric acid needed to react with 0.22 g of Y is :

A. 50mL

B. 80mL

C. 120mL

D. 200mL

Answer: a

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220. A 0.200g sample of benzonic acid, C_6H_5COOH, is titrated with a 0.120 M $Ba(OH)_2$ solution. What volume of the $Ba(OH)_2$ solution is required to reach the equivalance point?

Substance	Molar mass
C_6H_5COOH	$122.1\ \text{g}\ \ mol^{-1}$

A. 6.82mL

B. 13.6mL

C. 17.6mL

D. 35.6mL

Answer: a

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221. A 1.50 mL sample of a sulphuric acid solution from an automobile storage battery is titrated with 1.47 M sodium, hydroxide solution to a phenophthalein endpoint. Requiring 23.70mL. What is the molarity of the sulphuric acid solution?

A. 23.3M

B. 11.6M

C. 6.30M

D. 0.181M

Answer: b

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222.

$5H_2C_2O_4(aq) + 2MnO_4(aq) + 6H^+(aq) \rightarrow 2Mn^{2+}(aq) + 10CO_2(g) + 8$

Oxalic acid, $H_2C_2O_2$, reacts with permanganate ion accroding to the balanced equation above. How many mL of 0.0154 M $KMnO_4$ solution are required to react with 25.0mL of 0.208 M $H_2C_2O_4$ solution?

A. 13.5mL

B. 18.5mL

C. 33.8mL

D. 84.4mL

Answer: a

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223. A 25.00mL sample of 0.1050 MH_2SO_4 is titrated with a NaOH solution of unknown concentration. The phenophthalein endpoint was reached when 17.23 mL of the $NaOH$ solution had been added. What is the concentration of the NaOH?

A. 0.07617 M

B. 0.1447M

C. 0.1524M

D. 0.3047M

Answer: d

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224. Acidified solution of dichromate ion, $Cr_2O_7^{2-}$ oxidize Fe^{2+} to Fe^{3+}, forming Cr^{3+} in the process. What volume of 0.175 M $K_2Cr_2O_7$ in mL is required to oxidize 60.0mL of 0.250 M $FeSO_4$?

A. 14.3

B. 28.6

C. 42.9

D. 85.7

Answer: a

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225. When potassium permanganate, $KMnO_4$, is added to an acidified solution of oxalic acid, $H_2C_2O_4$, the products are CO_2 gas and Mn^{2+} ions. What is the reducing agent in this reaction?

A. $KMnO_4$

B. $H_2C_2O_4$

C. H_3O^+

D. CO_2

Answer: b

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226. In the titration of a monoprotic acid with a solution of sodium hydroxide of known concentration, what quantites are equal at the equivalaence point?

A. The concentrations of hydroxide and hydronium ions

B. The number of moles of hydroxide ion added and the number of moles of hydronium ion initially present

C. The volume of sodium hydroxide solution added and the volume of acid solution initially present

D. The number of moles of hydroxide ion added and the number of moles of monoprotic acid initially present

Answer: d

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227. A solution of $Na_2S_2O_3$ is standardizes iodometrically against 0.1262 g of $KBrO_3$ where BrO_3^- changes to Br^- . This process requires 45mL of the $Na_2S_2O_3$ solution. What is the molariy fo the $Na_2S_2O_3$? [M.W. of $KBrO_3$=167]

A. 0.2

B. 0.1

C. 0.05

D. 0.01

Answer: b

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228. For the following reaction $C_6H_5NO_2 + O_2 \rightarrow CO_2 + H_2O + N_2$

Choose the correct statement (s).

A. Number of electrons lost by one molecule of $C_6H_5NO_2$ are 25

B. One mole $C_6H_5NO_2$ required 11.2 mole oxygen atoms for complete oxidation.

C. One mole $C_6H_5NO_2$ on combustion give 22.4 litre $N_2(g)$ at 1atm and 273 K

D. One mole of $C_6H_5NO_2$ on combution give 22.4 litre $H_2O(l)$ at 1 atm and 273K

Answer: a

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229. 40mL 0.1 N $KMnO_4$ is equivalent to 30mL KHC_2O_4 solution. How many mL of 0.1 N KOH are required to titrate 60mL of same KHC_2O_4 solution?

A. 40mL

B. 30mL

C. 28.57mL

D. 35.5mL

Answer: a

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230. An aqueous solution of 18 gm oxalic acid $(H_2C_2O_4)$ is made up to 400 ml. calculate the volume of 0.1 M NaOH required to completely neutralize of 50 mL of above solution.

A. 500 mL

B. 50 mL

C. 400 mL

D. 200 mL

Answer: a

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231. How many milli grams of $Fe_{0.9}O$ reacts completely with 10 mL 0.1 M $KMnO_4$ solution in acidic conditions ? (Fe =56)

A. 47

B. 402

C. 534

D. 570

Answer: b

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232. 0.32 grams of N_2H_4 was oxidised by 100 mL, 0.1 M KIO_3 in conc. HCl where N_2H_4 is converted to N_2. possible conversion of KIO_3 is

A. $KIO_3 \rightarrow I_2$

B. $KIO_3 \rightarrow Icl$

C. $KIO_3 \rightarrow KIO_4$

D. $KIO_3 \rightarrow Kl$

Answer: b

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233. A solution of $Ba(OH)_2$ is standardized with potassium acid phthalate (abbreviated KHP), $KHC_8H_8O_4$ (M=204). If 1.530 g of KHP is titrated with 34.50 mL of the $Ba(OH)_2$ solution, what is the molarity of $Ba(OH)_2$?

A. 0.0217 M

B. 0.435 M

C. 0.109 M

D. 0.217 M

Answer: c

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234. What volume (in mL) of 0.0500 M phospheric acid is needed to titrate completely 25.0 mL of 0.150 M barium hydroxide solution to a phenolphthalein end point ?

$3Ba(OH)_2 + 2H_3PO_4 \rightarrow Ba_3(PO_4)_2 + 6H_2$

A. 50

B. 75

C. 100

D. 150

Answer: a

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235. A studend gets fingerprints on a cuvette before using it to determine the concentration of a coloured species using its known extinction

coefficient. What is the effect on the absorbance and reported concentration ?

A. absorbance Increased Reported concentration too law

B. absorbance Increased Reported concentration too high

C. absorbance decreased Reported concentration too low

D. absorbance decreased Reported concentration too high

Answer: b

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236. Amount of oxalic acid present in a solution can be determined by its titration with $KMnO_4$ solution in the presence of H_2SO_4. The titration gives unsatisfactory result when carried out in the presence of HCl because HCl:

A. furnishes H^+ ions in addition to those from oxalic acid.

B. reduced permanganate to Mn^{2+}

C. oxidised oxalic acid to carbon dioxide and water.

D. gets oxidised by oxalic acid to chlorine.

Answer: b

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237. In the reaction $H_2O_2^{18} + O_3 \rightarrow$ water + oxygen, radioactivity will be shown by which of the product ?

A. Water

B. oxygen

C. Both (a) and (b)

D. None of these

Answer: b

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238. Which method (s) can be used to determine the concentration of HNO_3 in an aqueous solution of nitric acid ?

(P) Titration with a standard base

(Q) Titration with a standard oxidizing agent

(R) Precipitation with Ag^+

A. P only

B. R only

C. P and Q only

D. P,Q and R

Answer: a

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239. Which separation technique is based on difference in the volatility of the of the substances to be separated ?

A. Filtration

B. Distillation

C. Solvent extraction

D. Paper chromatography

Answer: b

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240. A student is asked to measure 12 mL of a liquid as precisely as possible. Which piece of equipment should she select for this task ?

A. 25 mL beaker

B. 25 mL graduated cylinder

C. 25 mL conical flask

D. 25 mL volumetric flask

Answer: b

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241. The principal reason that solid sodium hydroxide is not used as a primary standard for acid-base titration is that it :

A. absorbes water from air

B. has a low molar mass

C. reacts slowly with many acids

D. ionizes in water

Answer: a

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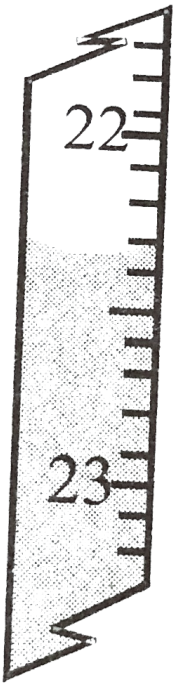
242. What value should be reported for the buret reading shown for a coloured solution ?



A. 22.3 mL

B. 22.30 mL

C. 22.36 mL

D. 22.40 mL

Answer: a

Watch Video Solution

243. Which piece of apparatus can measure a volume of 25.0 mL most precisely ?

A. 25 mL beaker

B. 25 mL conical flask

C. 25 mL graduated cylinder

D. 25 mL pipet

Answer: d

Watch Video Solution

244. Which solution can serve as both reactant and indicator when it is used in redox titrations ?

A. $FeNH_4(SO_4)_2$

B. $KMnO_4$

C. $H_2C_2O_4$

D. $Na_2S_2O_3$

Answer: b

Watch Video Solution

245. A standard HCl solution is titration to a pink phenolphtalein endpoint by adding NaOH solution while stirring. If a solution becomes pink throughout but loses its colour upon standing for a short time, what should be done to restore the coloure ?

A. Add more phenolphthalein indicator

B. Add an additional drop of NaOH solution

C. Add an additional drop of HCl solution.

D. Stir more vigorously.

Answer: b

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246. In the determination of the molar mass of a solid acid by titrating it with a standardized base, which procedural error will yield a molar mass that is smaller than the actual value?

A. Adding the standardized base to a buret containing drops of water

B. Dissolving the weighed solid acid in twic the recommended volume of water

C. Using half as many drops of indicator as suggested

D. Weighing out half of the recommended mass of solid acid

Answer: a

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247. A NaOH solution is to be standarized by titrating its against a known mass of potassium hydrogen phthalate. Which procedure will give a molarity of NaOH that is too low ?

A. Deliberately weighing one half the recommended amount of potassium hydrogen phtalate.

B. Dissoving the potassium hydrogen phtalate in more water than is recommeded.

C. Neglecting to fill the tip of the buret with NaOH solution before titrating.

D. Lossing some of the potassium hydrogen phthalate solution from the flask before

Answer: c

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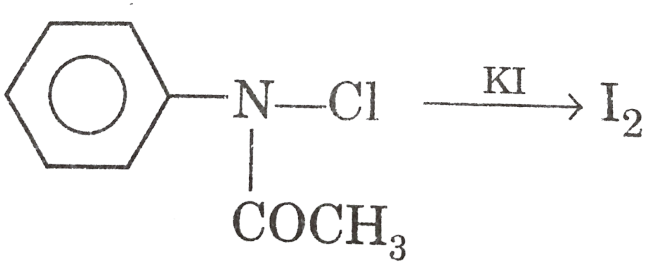


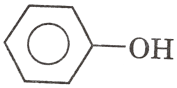
248.

Kinetics can be studied by titration using

A. $Na_2S_2O_3$

B. $KmMnO_4$

C. $H_2C_2O_4$

D. 

Answer: a

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249. For the reaction :

$Cl_2(aq) + 2Br^-(aq) \rightarrow Br_2(aq) + 2Cl^-(aq)$

Which of the following could be used to monitor the rate ?

(P) pH meter

(Q) Spectrophotometer

A. P only

B. Q only

C. Either P or Q

D. Neither P nor Q

Answer: b

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250. All of the following can be used as primary standards in acid-base titration except :

A. oxalic acid

B. potassium hydrogen phthalate

C. sodium carbonate

D. sodium hydroxide

Answer: d

Watch Video Solution

251. Which experimental procedure is best suited to determine the H_2O_2 concentration in an aqueous solutions ?

A. Precipitaiton with standard $MgCl_2$ solution

B. Reaction withb excess Zn to form H_2

C. Titration with standard H_2SO_4

D. Titration with standard $KMnO_4$

Answer: d

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252. The table below shows the data for three titrations to determine the concentration of a NaOH solution With standard 0.200 M HCl solution using phenolphthalein as the indicator

Trial	Vol HCl, mL	Vol NaOH, mL	M_{NaOH}, calc.
1	21.43	19.26	0.223
2	18.57	16.73	0.222
3	22.20	21.14	0.210

Which explanation best accounts for the lower value of the NaOH M in Trial 3 ?

A. Some of the neutralized solution from Trial 2 was left in the flask for Trial 3.

B. The numner of drops of phenolphtalein was doubled in Trial 3.

C. The HCl concentration was used as 0.250 M in the NaOH molarity calculation .

D. A few drops of NaOH solution were spilled on the desktop in Trial 3.

Answer: d

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253. Statements 1:Moles of $KmnO_4$ required for oxidation of Fe^{+2} in acidic and basic medium will be different.

Statement 2: Final oxidation state to which Mn^{+7} will be reduced will be different in case of acidic and basic medium.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-1

C. Statement-1 Is True, Statement-2 is False .

D. Statement-1 is True False, Statement-2 is True.

Answer: a

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254. Statements 1: Both CrO_4^{2-} and $Cr_2O_7^{2-}$ ions when treated with acidified H_2O_2 solution gives blue solution which turns green on standing.

Statement 2: Blue solution of CrO_5 is stabilised in the presence of organic solvent,e.g., ether, pyridine, etc.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-2

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-2

C. Statement-1 Is True, Statement-2 is False .

D. Statement-1 is True False, Statement-2 is True.

Answer: b

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255. Statement 1: The oxidation state of oxygen in superoxide ion in KO_2, CsO_2 and RbO_2 is -1/2.

Statement 2: Since the oxidation state of an alkali metal in any compound is always +1, the oxidation state of oxygen is -1/2 in the O_2^- ion.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-3

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-3

C. Statement-1 Is True, Statement-2 is False .

D. Statement-1 is True False, Statement-2 is True.

Answer: a

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256. Assertion: In the redox reaction $8H^+(aq) + 4NO_3^- + 6Cl^- + Sn(s) \rightarrow SnCl_6^{2-} + 4NO_2 + 4H_2O$. the reducing agent is $Sn(s)$.

Reason In balacing half-reaction, $S_2O_3^{2-} \rightarrow S(s)$, the number of electrons added on the left is 4.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-4

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-4

C. Statement-1 Is True, Statement-2 is False .

D. Statement-1 is True False, Statement-2 is True.

Answer: b

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257. Statement 1: In the reaction, $MnO_4^- + 5Fe^{2+} + 4H_2O, MnO_4^-$ acts as oxidising agent.

Statement 2: In the above reaction, Fe^{2+} is converted to Fe^{3+}.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-5

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-5

C. Statement-1 Is True, Statement-2 is False .

D. Statement-1 is True False, Statement-2 is True.

Answer: a

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258. Assertion: If $200mL$ of $0.1NNaOH$ is added to $200mL$ of $0.1NH_2SO_4$ solution. Then the resulting solution is acidic.

Reason: If milliequivalent of acid is greater than milliequivalents of base, then upon mixing the solution is acidic.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-6

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-6

C. Statement-1 Is True, Statement-2 is False .

D. Statement-1 is True False, Statement-2 is True.

Answer: d

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259. Assertion: Equivalent weight of FeC_2O_4 in the reaction, $FeC_2O_4 +$ Oxidising agent $\rightarrow Fe^{3+} + CO_2$ is $M/3$, where M is molar mass of FeC_2O_4.

Reason: In theabove reaction, total two mole of electrons are given up by $1mole$ of FeC_2O_4 to the oxidising agent.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-7

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-7

C. Statement-1 Is True, Statement-2 is False .

D. Statement-1 is True False, Statement-2 is True.

Answer: c

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260. Assertion: In the titration of Na_2CO_3 with HCl using methyl orange indicator, the volume of acid required is twice that of the acid required using phenolphthalein as indicaton.

Reason: Two moles of HCl are required for the complete neutralisation of one mole of Na_2CO_3.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-8

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-8

C. Statement-1 Is True, Statement-2 is False .

D. Statement-1 is True False, Statement-2 is True.

Answer: b

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261. Identify the incorrect statements.

A. At Boyle's temperature, there exists a pressure where compressibility of a real gas is more than that of ideal gas.

B. The parent and daughter nuclei in a α-decay are isodiaphers.

C. The magnetic moment of Cr^{+1} is more than that of Cr.

D. The equivalent weight of Na_2CO_3 in its titration with HCl is 106 when phenolphthalien is used as an indicator.

Answer: a,c

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262. Which of the following reaction are example of redox reactions?

A. $KMnO_4 + H_2SO_4 + CO \rightarrow$

B. $K_2Cr_2O_7 + H_2SO_4 + HCl \rightarrow$

C. $CuSO_4 + KCN(\text{excess}) \rightarrow$

D. $CuSO_4 + KI(\text{excess}) \rightarrow$

Answer: a,b,c,d

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263. 100mL of H_2O_2 solution having volume strength 11.35 V is mixed with 50mL of 0.5M KI solution to liberate I_2 gas. All the I_2 gas liberated is trapped to form a 500mL solution termed as X. 200mL of the solution X of I_2 required 50mL hypo solution for conversion to I^- and $S_4O_6^{2-}$. Assuming all reactions to undergo 100% completion, identify to correct option (s)

A. Volume strength of remaining H_2O_2 solution will be 6.62V

B. Molarity of I_2 in solution X is 0.025M

C. Molarity of hypo solution taken is 0.2M

D. Moles of tetrathionate ions formed will be 0.01

Answer: a,b,c

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264. $25mL$ of $0.50MH_2O_2$ solution is added to $50mL$ of $0.20MKMnO_4$ is acid solution. Which of the following statements is true?

A. 0.010 mole of oxygen gas is liberated

B. 0.005 mole of $KMnO_4$ is left

C. 0.030g of oxygen gas is evolved

D. 0.0025 mole H_2O_2 does not react with $KMnO_4$

Answer: a,c,d

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265. Which of the following compounds acts both as an oxidising as wll as a reducing agent?

A. HNO_2

B. H_2O_2

C. H_2S

D. SO_2

Answer: a,b,d

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266. Which of the following samples of reducing agents is /are chemically equivalent to 25mL of 0.2 N $KMnO_4$ to be reduced to Mn^{2+} and water?

A. 25mL of 0.2M $FeSO_4$ to be oxidized to Fe^{3+}

B. 50mL of 0.1M H_3AsO_3 to be oxidized to H_3AsO_4

C. 25mL of 0.1 H_2O_2 to be oxidized to H^+ and O_2

D. 25mL of 0.1 M $SnCl_2$ to be oxidized to Sn^{4+}

Answer: a,c,d

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267. In the titration of $K_2Cr_2O_7$ and ferrous sulphate, following data is obtained:

V_1 mL of $K_2Cr_2O_7$ solution of molarity M_1 requires V_2mL of $FeSO_4$ solution of molarity M_2.

Which of the following relations is /are true for the above titration?

A. $6M_1V_1 = M_2V_2$

B. $M_1V_1 = 6M_2V_2$

C. $N_1V_1 = N_2V_2$

D. $M_1V_1 = M_2V_2$

Answer: a,c

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268. 0.1M solution of KI reacts with excess of H_2SO_4 and KIO_3 solutions, according to equation

$5I^- + IO_3^- + 6H^+ \rightarrow 3I^2 + 3H_2O$, which of the following statements is /are correct:

A. 200mL of the KI solution react with 0.004 mole KIO_3

B. 100mL of the KI solution reacts with 0.006 mole of H_2SO_4.

C. 0.5 litre of the KI solution produced 0.005 mole of I_2

D. Equivalent weight of KIO_3 is equal to $\left(\frac{\text{Molecular weight}}{5}\right)$.

Answer: a,b,d

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269. The oxidation state of Fe in Fe_3O_4 is :

A. 2 and 3

B. $\frac{8}{3}$

C. 2

D. 3

Answer: a,b

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270. Consider the redox reaction

$2S_2O_3^{2-} + I_2 \rightarrow S_4O_6^{2-} + 2I^{\ominus}$

A. $S_2O_3^{2-}$ gets reduced to $S_4O_6^{2-}$

B. $S_2O_3^{2-}$ gets oxidised to $S_4O_6^{2-}$

C. I_2 gets reduced to I^-

D. I_2 gets oxidised to I^-

Answer: b,c

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271. Which of the following are examples of disproportionation reaction?

A. $HgO \rightarrow Hg + O_2$

B. $KClO_3 \rightarrow KCl + O_2$

C. $KClO_3 \rightarrow KVlO_4 + KCl$

D. $Cl_2 + OH^- \rightarrow ClO^- + Cl^- + H_2O$

Answer: c,d

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272. Two samples of HCl of $1.0M$ and $0.25M$ are mixed. Find volumes of these samples taken in order to prepare $0.75MHCl$ solution. Assume no water is added.

(I) $20mL$, $10mL$ (II) $100mL$, $50mL$k

(III) $40mL$, $20mL$ (IV) $50mL$, $25mL$

A. 20mL,10mL

B. 100mL,20mL

C. 40mL,20mL

D. 50mL,25mL

Answer: a,b,c,d

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273. Equal weights of X (atomic weight = 36) and Y (atomic weight = 24) are reacted to form the compound X_2Y_3, which of the following is/are correct

A. X is the limiting reagent

B. Y is the limiting reagent

C. no reactant is left over

D. Mass of X_2Y_3 formed is double the mass of 'X' taken

Answer: c,d

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274. Choose the correct statement(s):

A. 1 mole of MnO_4^- ion can oxidise 5 moless of Fe^{2+} ion in acidic medium

B. 1 mole of $Cr_2O_7^{2-}$ ion can oxidise 6 moles of Fe^{2+} ion in acidic medium

C. 1 mole of Cu_2S can be oxidised by 1.6 moles of MnO_4^- ion in acidic medium

D. 1 mole of Cu_2S can be oxidised by 1.33 moles of $Cr_2O_7^{2-}$ ion in acidic medium

Answer: a,b,c,d

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275. For the reaction :$I_2 + NaOH \rightarrow NaIO_3 + NaI + H_2O$. Identify the correct statements.

(At.wt. of Na=23)

A. Reaction is an example of disproportionation

B. Equivalent weight of $I_2 = \frac{3}{5} \times (\text{mol. wt.of } I_2)$

C. Eq. wt of NaOH in the rection is 6.66

D. Eq. wt of NaOH in the reaction is 48

Answer: a,b,d

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276. Three different solutions of oxidising agents $KMnO_4, K_2Cr_2O_7$ and I_2 is titrated separately with 0.158 gm of $Na_2S_2O_3$. If molarity of each oxidising agent is 0.1 M and reactions are :

I. $MnO_4^- + S_2O_3^{2-} \rightarrow MnO_2 + SO_4^{2-}$

II $CrO_7^{2-} + S_2O_3^{2-} \rightarrow Cr^{3+} + SO_4^{2-}$

III. $I_2 + S_2O_3^{2-} \rightarrow S_4O_6^{2-} + I^-$

A. Volume of $KMnO_4$ used in maximum

B. volume of iodine used in minimum

C. weight of I_2 used in titration is maximum

D. gram equivalent of $Na_2S_2O_3$ are same in all the reactions.

Answer: a,b

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277. Choose the correct statement(s):

A. 1 mole of MnO_4^- ion can oxidise 10 moless of Fe^{2+} ion in acidic medium

B. 1 mole of $Cr_2O_7^{2-}$ ion can oxidise 12 moles of Fe^{2+} ion in acidic medium

C. 2 mole of Cu_2S can be oxidize by 2.6 moles of Mn O_4^- ion in acidic medium.

$(Cu_2S \to Cu^{2+} + SO_2)$

D. 2 moles of Cu_2S can be oxidize by 8/3 moles of $Cr_2O_7^{2-}$ ion in acidic medium

$(Cu_2S \rightarrow Cu^{2+} + SO_2)$

Answer: a,b,c

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278. A mixture containing substance 'X' and 'Y' is mixed with a substance 'Z' . If Z' reacts with both X and Y then, select the correct option (s).

A. Moles of X+ Moles of Y= Total moles of Z reacted " is always applicable"

B. Equivalent of X +equivalent of Y= Total equivalent of Z reacted " is always applicable"

C.

$$\frac{\text{Equivalent of X}}{(\text{n-factor of Z in reaction with X})} + \frac{\text{Equivalent of Y}}{(\text{n- factor of Z in reaction with}}$$

D.

$$[\text{Moles of Z reacted in reaction with X}] + [\text{Moles of Z reacted in reacte}$$

Answer: c,d

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279. A compound can be formed by the elements A,B and C having oxidation state +1,+2 and -3 respectively. Then which compound may be formed?

A. ABC

B. B_3C_2

C. A_2BC

D. A_4BC_2

Answer: a,d

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280. 66 gm sample of an oxalate salt $Al_xH_y(C_2O_4)_z.nH_2O$ is dissolved in water to form 500mL solution. 50mL solution requires 60mL of 0.5M $Ba(OH)_2$ and 240mL 0.1 M $KMnO_4$ in acidic medium separately. If in salt x,y,z and n are present in simplest ratio, then select the correct statement(s).

A. Moles of oxalate salt in original sample is 0.2

B. Ratio of y/z is equal is 1

C. Value of (x+y+z)-n=5

D. Number of oxalate ion per molecule of oxalate salt is 2

Answer: a,b,c

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281. x mol of oxalate $FeC_2O_4.Fe_2(C_2O_4)_3.2H_2O$ on reaction with $Al_2(Cr_2O_7)_3$ requires 500mL 0.4M of it. Select the correct statement(s)

A. n-factor of $Al_2(Cr_2O_7)_3$ is 6

B. n-factor of $Al_2(Cr_2O_7)_3$ is 18

C. Moles of oxalate which react with $Al_2(Cr_2O_7)_3$ is 0.4

D. Moles of oxalate which react with $Al_2(Cr_2O_7)_3$ is 0.65

Answer: b,c

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282. A sample containing 1 mol $KHC_2O_4.H_2C_2O_4$ is titrated with different reagent. Select correct statement.

A. 1 mol of KOH are used

B. $\frac{3}{2}$ moles of $Ba(OH)_2$ are used

C. $\frac{4}{5}$ mol of $KMnO_4$ are used in alkaline medium

D. $\frac{2}{3}$ mol of $K_2Cr_2O_7$ are used in acidic medium

Answer: b,d

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283. Barium permangnate solution (20mL, 0.1 M) is mixed with 0.1 N I^- giving precipitate fo IO_3^- and MnO_2 . Resulting solution is filtered and titrated against Mo^{3+}, giving MoO_2^{2+} and Mn^{2+}. Which required 0.5 M, 10mL acidified Mo^{3+} .Select the correct option (s).

A. Volume of I^- solution taken is 30mL

B. Volume of I^- solution taken is 50mL

C. Per mole Mn^{2+} formed, 4 moles of H^+ are consumed

D. Per mole IO_3^- formed, 2 moles of MnO_4^- are consumed

Answer: a,d

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284. $H_2C_2O_4$ and $NaHC_2O_4$ behave as acids as well as reducing agents. Which are the correct statements?

A. Equivalent weight of $H_2C_2O_4$ and $NaHC_2O_4$ are equal to their molecular weights when behaving as reducing agents.

B. 100mL of 1N solution of each is neutralised by same volume of 1N $Ca(OH)_2$.

C. 100mL of 1N solution of each is neutralised by same volume of 1M $Ca(OH)_2$.

D. 100 mL of 1 N solution of each is oxidised by same volume of 1 N $KMnO_4$ solution in acidic medium.

Answer: b,d

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285. Consider two reaction: (X represent an element)

Reaction I: $H_2XO_4 + KOH \rightarrow K_2XO_4 + H_2O$

Reaction II: $H_2XO_4 + KI \rightarrow H_2X + I_2$

which of the following statements (s) is /are incorrect ?

A. Molar mass of H_2XO_4 is equal in both reactions

B. Equivalent mass of H_2XO_4 is equal in both reactions

C. Equivalent mass of H_2XO_4 in Reaction-I is twice as in Reaction -II

D. One mole of H_2XO_4 will contain same number of equivalent in both reactions

Answer: b,c,d

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286. A,B and C are three elements forming a compound in which their oxidation state are +2,+5, and -2 respectively. Which could not be the formula of compound?

A. $A_2(BC)$

B. $A_2(BC_4)_3$

C. $A_3(BC_4)_2$

D. ABC_2

Answer: a,b,d

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287. A solution is prepared by dissolving a solid mixture of $K_2C_2O_4$ and KHC_2O_4. A 10mL portion of this solution required 10mL,0.05 M KOH solution for titration reaction. In a separate analysis 10mL ,0.06 M acidified $KMnO_4$ solution for titration. Which of the following are correct?

A. The original mixture contains $K_2C_2O_4$ and KHC_2O_4 in 2:1 molar ratio.

B. 20mL of the original stock solution require 3 millimoles of acidified dichromate solution for titration

C. 20mL of the original stock solution requires 6 milli-equivalents of acidified dichromate solution for titration

D. The original mixture contains $K_2C_2O_4$ and KHC_2O_4 in 1:2 molar ratio

Answer: a,c

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288. One mole of $KMnO_4$ is used for complete oxidation of Fe_2SO_4, FeC_2O_4 and $H_2C_2O_4$ respectively (and seperately). Pick up the correct statements:

A. 5 mole of Fe_2SO_4 can be oxidised

B. $\frac{3}{5}$ mole of FeC_2O_4 can be oxidised

C. $\frac{5}{3}$ mole of $Fe_2C_2O_4$ can be oxidised

D. 2.5 mole of $H_2C_2O_4$ can be oxidised

Answer: c,d

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289. If 1 mole of $H_4P_2O_7$ is reacted with 1 mole of $A(OH)_3$ as $H_4P_2O_7 + A(OH)_3 \rightarrow AHP_2O_7 + 3H_2O$ then:

(Atomic wt. of A=69,P=31)

A. equivalent weight of base is 40

B. equivalent weight of $H_4P_2O_7$ is 59.34

C. equivalent weight of base is 60

D. if maximum oxidation number of A is +5 then it can also participate in redox titration.

Answer: a,b,d

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290. Choose correct statements.

A. In the balanced redox reaction

$$xAs_2S_3 + yNO_3^- + 4H_2O \rightarrow aAsO_4^{3-} + bNO + cSO_4^{2-} + 8H^+$$

molar ratio of x:y=3:28

B. when NH_4SCN oxidizes into SO_4^{2-}, CO_3^{2-} and NO_3^- its equivalent weight will be $\frac{M}{24}$

C. when Bi_2S_3 converted into Bi^{5+} and S, n-factor will be 7

D. Equivalent weight of H_3PO_2 when it disproportionates into PH_3 and H_3PO_3 is $3\frac{M}{4}$

Answer: a,b,d

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291. Select the correct statements.

A. In a mixture of KHC_2O_4 and $H_2C_2O_4$, $KMnO_4$ decolourises faster at higher temperature than lower temperature.

B. A catalyst participates in a chemical reaction by forming temporary bonds with the reactant resulting in an intermediate complex.

C. In collision theory, only activation energy determine the criteria for effective collision.

D. Collision theory assumes molecules to be soft spheres and consider their structural aspects.

Answer: a,b

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292. In the following reaction:

$$Cr(OH)_3 + OH^- + IO_3^- \rightarrow CrO_4^{2-} + H_2O + I^-$$

A. IO_3^- is oxidising agent

B. $Cr(OH)_3$ is oxidised

C. $6e^-$ are being taken per iodine atom

D. none of these

Answer: a,b

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293. Equivalent Mass

The eqivalent mass of a substance is defined as the number of parts by mass of it which combine with or displace 1.0078 parts by mass of hydrogen, 8 parts by mass of oxygen and 35.5 parts by mass of chlorine. The equivalent mass of a substance expressed in grams is called gram equivalent mass.

The equivalent mass of a substance is not constant. It depends upon the reaction in which the substance is participating. A compound may have different equivalent mass in different chemical reactions and under different experimental conditions.

(a) Equivalent mass of an acid

It is the mass of an acid in grams which contains 1.0078 g of replaceable H^+ ions or it is mass of acid which contains one mole of replaceable

H^+ ions. It may be calculated as :

Equivalent mass of acid=$\frac{\text{Molecular mass of acid}}{\text{Basicityof acid}}$

Basicity of acid = Number of replaceable hydrogen atoms present in one molecule of acid

(b) Equivalent mass of a base

It is the mass of the base which contains one mole of replaceable OH^- ions in molecules.

Equivalent mass of base=$\frac{\text{Molecular mass of acid}}{\text{Acidity of acid}}$

Acidity of base= Number of replaceable OH^- ions present in one molecule of the base

Equivalent mass of an oxidising agent

(a) Electron concept:

Equivalent mass of oxidising agent = $\frac{\text{Molecular mass of oxidising agent}}{\text{Number of electrons gained by one molecule}}$

(b) Oxidation number concept:

Equivalent mass of oxidising agent= $\frac{\text{Molecular mass of oxidising agent}}{\text{Total change in oxidation number per molecule of oxidising agent}}$

Equivalent mass of $Ba(MnO_4)_2$ in acidic medium is :(where M stands for molar mass)

A. $\frac{M}{5}$

B. $\frac{M}{6}$

C. $\frac{M}{10}$

D. $\frac{M}{2}$

Answer: c

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Basicity of acid = Number of replaceable hydrogen atoms present in one molecule of acid

(b) Equivalent mass of a base

It is the mass of the base which contains one mole of replaceable OH^- ions in molecules.

Equivalent mass of base=$\frac{\text{Molecular mass of acid}}{\text{Acidity of acid}}$

Acidity of base= Number of replaceable OH^- ions present in one molecule of the base

Equivalent mass of an oxidising agent

(a) Electron concept:

Equivalent mass of oxidising agent = $\frac{\text{Molecular mass of oxidising agent}}{\text{Number of electrons gained by one molecule}}$

(b) Oxidation number concept:

Equivalent mass of oxidising agent= $\frac{\text{Molecular mass of oxidising agent}}{\text{Total change in oxidation number per molecule of oxidising agent}}$

Equivalent mass of $Fe_{0.9}O$ in reaction with acidic $K_2Cr_2O_7$ is : (M= Molar mass)

A. $7\frac{M}{10}$

B. $10\frac{M}{7}$

C. $7\frac{M}{9}$

D. $9\frac{M}{7}$

Answer: b

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Basicity of acid = Number of replaceable hydrogen atoms present in one molecule of acid

(b) Equivalent mass of a base

It is the mass of the base which contains one mole of replaceable OH^- ions in molecules.

Equivalent mass of base=$\frac{\text{Molecular mass of acid}}{\text{Acidity of acid}}$

Acidity of base= Number of replaceable OH^- ions present in one molecule of the base

Equivalent mass of an oxidising agent

(a) Electron concept:

Equivalent mass of oxidising agent = $\frac{\text{Molecular mass of oxidising agent}}{\text{Number of electrons gained by one molecule}}$

(b) Oxidation number concept:

Equivalent mass of oxidising agent= $\frac{\text{Molecular mass of oxidising agent}}{\text{Total change in oxidation number per molecule of oxidising agent}}$

Equivalent weight of oxalic acid salt in following reaction is :(Atomic masses:O=16,C=12,K=39) $H_2C_2O_4 + Ca(OH)_2 \rightarrow CaC_2O_4 + H_2O$

A. 90

B. 45

C. 64

D. 128

Answer: c

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Equivalent mass of acid=$\frac{\text{Molecular mass of acid}}{\text{Basicity of acid}}$

Basicity of acid = Number of replaceable hydrogen atoms present in one molecule of acid

(b) Equivalent mass of a base

It is the mass of the base which contains one mole of replaceable OH^- ions in molecules.

Equivalent mass of base=$\frac{\text{Molecular mass of acid}}{\text{Acidity of acid}}$

Acidity of base= Number of replaceable OH^- ions present in one molecule of the base

Equivalent mass of an oxidising agent

(a) Electron concept:

Equivalent mass of oxidising agent = $\frac{\text{Molecular mass of oxidising agent}}{\text{Number of electrons gained by one molecule}}$

(b) Oxidation number concept:

Equivalent mass of oxidising agent= $\frac{\text{Molecular mass of oxidising agent}}{\text{Total change in oxidation number per molecule of oxidising agent}}$

Which of the following is not a disproportionation reaction?

A. $P_4 + NaOH \rightarrow NaH_2PO_2 + PH_3$

B. $BaC_2 + N_2 \rightarrow Ba(CN)_2$

C. $Hg_2I_2 \rightarrow HgI_2 + Hg$

D. $Ca(OH)_2 + Cl_2 \rightarrow CaOCl_2 + H_2O$

Answer: b

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297. Equivalent Mass

The eqivalent mass of a substance is defined as the number of parts by mass of it which combine with or displace 1.0078 parts by mass of hydrogen, 8 parts by mass of oxygen and 35.5 parts by mass of chlorine. The equivalent mass of a substance expressed in grams is called gram equivalent mass.

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(b) Equivalent mass of a base

It is the mass of the base which contains one mole of replaceable OH^- ions in molecules.

Equivalent mass of base=$\frac{\text{Molecular mass of acid}}{\text{Acidity of acid}}$

Acidity of base= Number of replaceable OH^- ions present in one molecule of the base

Equivalent mass of an oxidising agent

(a) Electron concept:

Equivalent mass of oxidising agent = $\frac{\text{Molecular mass of oxidising agent}}{\text{Number of electrons gained by one molecule}}$

(b) Oxidation number concept:

Equivalent mass of oxidising agent= $\frac{\text{Molecular mass of oxidising agent}}{\text{Total change in oxidation number per molecule of oxidising agent}}$

When NO_2 is dissolved in water solution become acidic. Equivalent weight of NO_2 in this reaction $(NO_2 + H_2O \rightarrow HNO_3 + HNO_2)$ is :

A. 28

B. 46

C. 92

D. 14

Answer: c

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298. In a balanced redox reaction net gain of electron (s) is equal to net loss of electrons (s).n_{factor} is a reaction specific parameter and for intermolecular redox reaction n-factor of oxidising reducing agent is the no. of moles of electron gained /lost by one mole of compound.

The n_{factor} of KI in the following reaction is :

$$CuSO_4 + KI \rightarrow Cu_2I_2 + K_2SO_4 + I_2$$

A. 1

B. 2

C. $\frac{1}{4}$

D. none of these

Answer: b

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299. In a balanced redox reaction net gain of electron (s) is equal to net loss of electrons (s).n_{factor} is a reaction specific parameter and for intermolecular redox reaction n-factor of oxidising reducing agent is the no. of moles of electron gained /lost by one mole of compound.

50mL 0.1 M $CuSO_4$ are mixed with 50mL of 0.1 M KI then, number of moles of electrons involved in the reaction will be:

A. 4

B. 2.5

C. 2.5×10^{-3}

D. none of these

Answer: c

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300. In a balanced redox reaction net gain of electron (s) is equal to net loss of electrons (s).n_{factor} is a reaction specific parameter and for intermolecular redox reaction n-factor of oxidising reducing agent is the no. of moles of electron gained /lost by one mole of compound.

Consider the following reaction:

$CrO_5 + H_2SO_4 \rightarrow Cr_2(SO_4)_3 + H_2O + O_2$

One mole of CrO_5 will liberate how many moles of O_2?

A. $\frac{7}{4}$

B. $\frac{5}{4}$

C. 1

D. none of these

Answer: a

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301. A 100mL solution containing 0.4 M As_2S_3, 5M NaOH and 6M H_2O_2 are reacted to form AsO_4^{3} and SO_4^{2-} as product.

What may be the correct coefficient of As_2S_3, H_2O_2 and NaOH respectively in a balanced reaction?

A. 1,14,12

B. 1,12,14

C. 1,28,20

D. 1,28,18

Answer: a

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302. A 100mL solution containing 0.4 M As_2S_3, 5M NaOH and 6M H_2O_2 are reacted to form AsO_4^{3} and SO_4^{2-} as product.

If final solution is allowed to stand for some time, what maximum volume of O_2 at 1 atm and 273K can be obtained by decomposition of H_2O_2?

A. 112mL

B. 224mL

C. 336mL

D. 448mL

Answer: d

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303. Potassium dichromate $(K_2Cr_2O_7)$ is an orange coloured compound, very frequently used in laboratory as an oxidising agent as well as in a redox titration. It is generally prepared from chromit $(FeCr_2O_4)$ ore according to the following reactions:

(a) Fusion of chromite ore with sodium carbonate in excess of air.

$$FeCr_2O_4 + Na_2CO_3 + O_2 \rightarrow Na_2CrO_4 + Fe_2O_3 + CO_2$$

(b) Acidifying filetered sodium chromate solution with sulphuric acid.

$$Na_2CrO_4 + H_2SO_4 \rightarrow Na_2Cr_2O_7 + Na_2SO_4 + H_2O$$

(c) Treating sodium dichromate with potassium chloride.

$Na_2Cr_2O_7 + KCl \rightarrow K_2Cr_2O_7 + NaCl$

Answer the following questions using above information.

If you are intially provided with 224 gm of pure chromite ore and 169.6gm of sodium carbonate, the minimum volume of air required at 1 atm and 273 K to consume at least one of the reactant completely, if aire contains 20% by volume of oxygen gas is :

A. 156.8L

B. 196L

C. 28L

D. 152.4L

Answer: a

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304. Potassium dichromate $(K_2Cr_2O_7)$ is an orange coloured compound, very frequently used in laboratory as an oxidising agent as well as in a redox titration. It is generally prepared from chromit

$(FeCr_2O_4)$ ore according to the following reactions:

(a) Fusion of chromite ore with sodium carbonate in excess of air.

$$FeCr_2O_4 + Na_2CO_3 + O_2 \rightarrow Na_2CrO_4 + Fe_2O_3 + CO_2$$

(b) Acidifying filetered sodium chromate solution with sulphuric acid.

$$Na_2CrO_4 + H_2SO_4 \rightarrow Na_2Cr_2O_7 + Na_2SO_4 + H_2O$$

(c) Treating sodium dichromate with potassium chloride.

$$Na_2Cr_2O_7 + KCl \rightarrow K_2Cr_2O_7 + NaCl$$

Answer the following questions using above information.

If the number of moles of reactants available for reactions are: {$FeCr_2O_4$ =0.25 moles, O_2=0.35 moles, Na_2CO_3=0.60 moles, H_2SO_4=0.2 mol,es, KCl=0.1 moles}, then the maximum number of moles of $K_2Cr_2O_7$, that can be produced is :

A. 0.05 moles

B. 0.1 moles

C. 0.2moles

D. 0.5moles

Answer: a

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305. Potassium dichromate $(K_2Cr_2O_7)$ is an orange coloured compound, very frequently used in laboratory as an oxidising agent as well as in a redox titration. It is generally prepared from chromit $(FeCr_2O_4)$ ore according to the following reactions:

(a) Fusion of chromite ore with sodium carbonate in excess of air.

$$FeCr_2O_4 + Na_2CO_3 + O_2 \rightarrow Na_2CrO_4 + Fe_2O_3 + CO_2$$

(b) Acidifying filetered sodium chromate solution with sulphuric acid.

$$Na_2CrO_4 + H_2SO_4 \rightarrow Na_2Cr_2O_7 + Na_2SO_4 + H_2O$$

(c) Treating sodium dichromate with potassium chloride.

$$Na_2Cr_2O_7 + KCl \rightarrow K_2Cr_2O_7 + NaCl$$

Answer the following questions using above information.

If whole of the chromite ore given in the previous question gets consumed and sufficient amount of rest of the reactants are given, then the mass of $K_2Cr_2O_7$ obtained is :

A. 14.7gm

B. 7.35 gm

C. 73.5gm

D. 147gm

Answer: c

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306. Drinking is injurious of health. But for revenue purpose government has fixed some permissible value for alcohol . The permissible value for the alcohol content in the blood is 1 % mass . On analysis of blood sample of a driver of being drunk over than the pernissible value , it was obtained that 60 gm sample reacted with 30 mL of $8MK_2Cr_2O_7$(Acidic solution) .

Reaction :

$2K_2Cr_2O_7 + 8H_2SO_4 + C_2H_5OH \rightarrow 2Cr_2(SO_4)_3 + 11H_2O + 2K_2SO_4 +$

Assume $K_2Cr_2O_7$ reacts only with the alcohol present in blood .

Will the driver be prosecuted for drunken driving?

A. yes

B. no

C. may or may not

D. Date insufficient

Answer: a

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307. Drinking is injurious of health. But for revenue purpose government has fixed some permissible value for alcohol . The permissible value for the alcohol content in the blood is 1 % mass . On analysis of blood sample of a driver of being drunk over than the pernissible value , it was obtained that 60 gm sample reacted with 30 mL of $8MK_2Cr_2O_7$(Acidic solution) .

Reaction :

$2K_2Cr_2O_7 + 8H_2SO_4 + C_2H_5OH \rightarrow 2Cr_2(SO_4)_3 + 11H_2O + 2K_2SO_4 +$

Assume $K_2Cr_2O_7$ reacts only with the alcohol present in blood .

What is the percentage of alcohol in the blood sample?

A. 0.092

B. 0.088

C. 0.008

D. 0.072

Answer: a

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308. Question 1 and 2 should be answered using the unbalanced equation,

$ClO_3^- + Br^- \rightarrow Cl_2 + Br_2$

Which is the reducing agent?

A. CiO_3^-

B. Br^-

C. Cl_2

D. Br_2

Answer: b

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309. Question 1 and 2 should be answered using the unbalanced equation,

$ClO_3^- + Br^- \rightarrow Cl_2 + Br_2$

When this equation in balanced, what is the Br^-/ClO_3^- ratio?

A. $1(1)$

B. $\frac{2}{1}$

C. $\frac{3}{1}$

D. $\frac{5}{1}$

Answer: d

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310. Match Column-I (Compounds) with Column-II (Oxidation states of Nitrogen) and select using the code given below the lists:

Column-I		Column-II	
(p)	NaN_3	(1)	$+5$
(q)	N_2H_2	(2)	$+2$
(r)	NO	(3)	$-\frac{1}{3}$
(s)	N_2O_5	(4)	-1

A. $\begin{matrix} p & q & r & s \\ 3 & 4 & 2 & 1 \end{matrix}$

B. $\begin{matrix} p & q & r & s \\ 4 & 3 & 2 & 1 \end{matrix}$

C. $\begin{matrix} p & q & r & s \\ 3 & 4 & 1 & 2 \end{matrix}$

D. $\begin{matrix} p & q & r & s \\ 4 & 3 & 1 & 2 \end{matrix}$

Answer: a

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311.

Column-I		Column-II	
(a)	4.1 g H_2SO_3	(p)	200 mL of 0.5 N base is used for complete neutralization
(b)	4.9 g H_3PO_4	(q)	200 millimoles of oxygen atoms
(c)	4.5 g oxalic acid ($H_2C_2O_4$)	(r)	Central atom is in its highest oxidation state
(d)	5.3 g Na_2CO_3	(s)	May react with an oxidising agent

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312.

Column-I		Column-II	
(a)	Sn^{+2} + MnO_4^- (acidic) 3.5 mole 1.2 mole	(p)	Amount of oxidant available decides the number of electrons transfer
(b)	$H_2C_2O_4$ + MnO_4^- (acidic) 8.4 mole 3.6 mole	(q)	Amount of reductant available decides the number of electrons transfer
(c)	$S_2O_3^{2-}$ + I_2 7.2 mole 3.6 mole	(r)	Number of electrons involved per mole of oxidant > Number of electrons involved per mole of reductant
(d)	Fe^{2+} + $Cr_2O_7^{2-}$ (acidic) 9.2 mole 1.6 mole	(s)	Number of electrons involved per mole of oxidant < Number of electrons involved per mole of reductant

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313. Match the following columns

Column-I (Underlined substance)		Column-II	
(a)	$\underline{S_8} + 12NaOH \longrightarrow Na_2S + 2Na_2S_2O_3 + 6H_2O$	(p)	Act as only oxidizing agent
(b)	$\underline{K_4[Fe(CN)_6]} + FeCl_3 \longrightarrow KFe[Fe(CN)_6] + 3KCl$	(q)	Act as only reducing agent
(c)	$\underline{2KClO_3} \longrightarrow 2KCl + 3O_2$	(r)	Act as both oxidizing and reducing agent
(d)	$\underline{Sb_2O_3} + KIO_3 + 2HCl + 6H_2O \longrightarrow 2HSb(OH)_6 + ICl + KCl$	(s)	Act as neither oxidizing nor reducing agent

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314.

Column-I		Column-II	
(a)	$K_3[Fe(CN)_6] + KOH + H_2O_2 \longrightarrow K_4[Fe(CN)_6] + H_2O + O_2$	(p)	Eq. wt of R.A. = M/2
(b)	$Cr(OH)_3 + NaOH + H_2O_2 \longrightarrow Na_2CrO_4 + H_2O$	(q)	Eq. wt of O.A. = M/2
(c)	$CaSO_4 + NH_3 + CO_2 + H_2O \longrightarrow CaCO_3\downarrow + (NH_4)_2SO_4$	(r)	Non redox reaction
(d)	$3XeF_4 + H_2O \longrightarrow 2Xe + XeO_3 + O_2 + HF$	(s)	Redox reaction
		(t)	Eq. wt of O.A. = M

(O.A=Oxidising agent, R.A= Reducing agent, M= Molecular weight)

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315. Match the following columns

Column-I		Column-II (No. of e^- involved in the reaction)	
(a)	$I_2 + SO_2 + 2H_2O \rightarrow SO_4^{2-} + 2I^- + 4H^+$	(p)	6
(b)	$3ClO^- + Br^- \rightarrow BrO_3^- + 3Cl^-$	(q)	12
(c)	$2ZnS + 3O_2 \rightarrow 2ZnO + 2SO_2$	(r)	1
(d)	$Br_2 + 2OH^- \rightarrow BrO^- + Br^- + H_2O$	(s)	2

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316. Calculate normality of a salt solution [of a metal sulphate] having concetration 21.6% w/v if its superoxide has 16% by mass of oxygen.

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317. A 25 mL sample of H_2SO_4 of unknown molarity is reacted with KI solution of molarity 0.8 M and volume 80mL. The excess acid required 10

mL of 2 M NaOH solution for complete neutralisation. Calculate molarity of the H_2SO_4 taken:

[Given : $KI + H_2SO_4 \rightarrow K_2SO_4 + I_2 + H_2S + H_2O$

$H_2SO_4 + NaOH \rightarrow Na_2SO_4 + H_2O$

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318. 0.0026 M I_2 solution having unknown volume is reacted with excess of ferrous thiocynate solution to form Fe_2O_3, SO_4^{2-}, CN^- along with I^- . If all the sulphate ions formed are precipitated using $BaCl_2$ such that 16776 gm of $BaSO_4$ is obtained, calculate volume of I_2 consumed in litre.

(At. mass : Ba=137)

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319. 100mL of H_2O_2 solution having volume strength 11.35 V is mixed with 500mL of 0.5M KI solution to liberate I_2 gas such that equilibria gets established. All the I_2 gas liberated is dissolved to form 500mL solution.

200ml of the solution required 50mL of $\frac{2}{3}$M hypo solution. Calculate volume strength fo remaining H_2O_2 mixture. Round off your answer.

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320. 100mL of 0.1M $KMnO_4$ is consumed in its titration with oxalic acid in presence of dil. HCl whose excess amount was taken. The $Cl_2(g)$ produced is reacted with excess of KI solution producing I_2 which required 170mL of 0.2 M hypo solution for complete reaction. Calculate millimoles of oxalic acid consumed.

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321. 29.2% (w/w) HCl stock solution has a density of 1.25 g mL^{-1}. The molecular weight of HCl is 36.5 g mol^{-1}. The volume (mL) of stock solution required to prepare a 200mL solution of 0.4 M HCl is :

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322. Calculate the normality of a solution obtained by mixing 50mL of 5M solution of $K_2Cr_2O_7$ and 50mL of 2 M $K_2Cr_2O_7$ in acidic medium.

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323. Calculate the normality of a solution containing 13.4 g fo sodium oxalate in 100mL solution.

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324. One litre of acidified $KMnO_4$ solution containing 15.8g $KMnO_4$ is decolourized by passing sufficient SO_2 . If SO_2 is produced by FeS_2 , what is the amount of FeS_2 required to give desired SO_2?

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325. Calculate the percentage of available chlorine in a sample of 3.55g of bleaching powder which was dissolved in 100mL of water. 25mL of this

solution, on treatment with KI and dilute acid, required 20 mL of 0.125 N sodium thiosulphate solution.

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326. In the following reaction, SO_4 acts as a reducing agent:

$$SO_2 + Cl_2 + 2H_2O \rightarrow H_2SO_4 + 3HCl$$

Find the equivalent weight of SO_2.

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327. It requires 40mL of 1 M Ce^{4+} to titrate 20mL of 1 M Sn^{2+} to Sn^{4+}. What is the oxidation state of the cerium in the product?

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328. 10mL of sulphuric acid solution (specific gravity= 1.84) contains 98% by weight of pure acid . Calculate the volume (in mL) of 2N NaOH solution

required to just neutrililze the acid.

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329. What is the percentage of free SO_3 in an oleum sample that is labelled as '104.5% H_2SO_4?

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330. 1 g of oleum sample is dilute with water. The solution required 54 mL of 0.4 N NaOH for complete neutralization. Find the percentage of free SO_3 in the sample?

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331. A 100 mL sample of water was treated to convert any iron present to Fe^{2+}. Addition of 25mL of 0.002M $K_2Cr_2O_7$ resulted in the reaction.

$$6Fe^{2+} + Cr_2O_7^{2-} + 14H^+ \rightarrow 6Fe^{3+} + 2Cr^{3+} + 7H_2O$$

The excess $K_2Cr_2O_7$ was back- titrated with 7.5mL of .01M Fe^{2+} solution. Calculate the parts per million (ppm) of iron in the water sample.

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332. A student of performs a titration with different burettes and finds titre values of $25.2mL$, $25.25mL$, and $25.0mL$. The number of significant figures in the average titre value is .....

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333. Among the following, the number of elements showing only one non-zero oxidation state is:

O,Cl,F,N,P,Sn,Tl,Na,Ti

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334. 0.2828 g of iron wire was dissolved in excess dilute H_2SO_4 and the solution was made upto 100mL. 20mL of this solution required 30mL of $\frac{N}{30}K_2Cr_2O_7$ solution for exact oxidation. Calculate percent purity of Fe in wire.

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335. 2.6 g of an element X is reacted with an aqueous solution containing NaOH and $NaNO_3$ to yield Na_2XO_2 and NH_3 .NH_3 thus liberated is absorbed in 100mL of 0.11 M H_2SO_4 . The excess acid required 48 mL of 0.25 M NaOH for complete neutralisation. Find the atomic weight of X.

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336. A sample consisting fo chocolate-brown powder of PbO_2 is allowed to react with excess of KI and iodine liberated is reacted with N_2H_4 in another container. The volume of N_2 gas liberated from this second container at STP was measured out to be 1.135 litre. Find the volume (in L)

of decimolar NaOH solution required to dissolved PbO_2 completely and convert it to Na_2PbO_3. (Assume all reactions are 100% complete).

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337. A $1g$ sample of Fe_2O_3 solid of $55.2\,\%$ purity is dissolved in acid and reduced by heating the solution with zinc dust. The resultant solution is cooled and made upto $100mL$. An aliquot of $25mL$ of this solution requires $17mL$ of $0.0167M$ solution of an oxidant for titration. Calculate no.of electrons taken up by oxidant in the above titration.

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338. A 0.56 g sample of limestones is dissolved in acid and the calcium is precipitated as calcium oxalate .The precipitate as calcium oxalate the prepcipate is filtered washed with water and dissolved in dil H_2SO_4 The solution required $40ml$ of $0.25NKmnO_4$ solutions for titration .Calculate percentage of CaO in limestone sample.

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339. 6 g of a mixture of ammonium sulphate and ammonium chloride was made up to 1000cc with water . 25cc of this solution was boiled with 50cc of $\frac{M}{10}$ sodium hydroxide until no more ammonia waws evolved and it was then found that the excess of sodium hydroxided required 24.3 cc of $\frac{N}{10}$ hydrochloric acid for neutrilisation. What was the mass percentage of ammonium chloride in the mixture?

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340. An aq. Solution of 0.5 M $KMnO_4$ is divided into two parts. One part of it requires 125mL of 1.5M aq. Solution of oxalate ions in acidic medium, while another part requires 270mL of 0.5 M aq. Solution of iodide ions in neutral medium which are converted into I_2 only. Calculated total volume (mL) of intial $KMnO_4$ solution.

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341. 1 mol of N_2H_4 loses 14 moles of electrons to from a new compound X. Assuming that the entire nitrogen appear in the new compound, what is the oxidation state of nitrogen in X?

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342. 50mL aqueous solution of Fe_2SO_4 was neutralized with 100mL of 0.2 M $KMnO_4$ and 200ml of 1 M H_2SO_4 solution. Find the molarity of $FeSO_4$ solution.

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343. The number of specie(s) which can react with acidified $KMnO_4$ out of the following specie(s) is /are $FeSO_4, Fe_2(SO_4)_3, O_3, FeC_2O_4, CuSO_4, Cu_2S, H_2O_2, NO_2^-, NO_3^-, SO_3^{2}$

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344. Certain moles of HCN are completely oxidized by 25mL of $KMnO_4$ into CO_2 and NO_3^-. When all CO_2 is passed through lime water $\left(Ca(OH)_2\right)$, 12.5gm of $CaCO_3$ is formed. What is molarity $KMnO_4$ used?

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345. 1mL of unknown solution of H_2SO_4 is diluted upto 100mL and then its 25mL is titrated with 10mL of 0.2 M NaOH. The excess acid required 10mL of 0.1 M $Ba(OH)_2$ solution. Find molarity of original H_2SO_4 solution.

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346. Find the number of chemical species in which underlined atom is in negative oxidation state $\underline{N}H_3$, $\underline{C}H_2Cl_2$, $\underline{N}_2O$, $H\underline{C}N$, $H\underline{N}O_2$, $\underline{C}N_2^{2-}$

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347. 2.5g of a mixture containing $CaCO_3, Ca(HCO_3)_2$ and NaCl was dissolved in 100mL water and its 10mL portion required 10mL 0.05M H_2SO_4 solution to reach the phenolphthalein end point. Another 10mL portion of the same stock solution required 32.35 mL of the same acid solution to reach the methyl orange end point. Determine mass percentage ratio of $CaCO_3$ and $Ca(HCO_3)_2$ in the original mixture.

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348. For the reaction

$$xI^- + yClO_3^- + zH_2SO_4 \rightarrow Cl^- + wHSO_4^- + 3I_2$$

The value of w is :

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349. α-D-glucopyranose reacts with periodate ion as follows:

$$C_6H_{12}O_6(aq) + IO_4^-(aq) \rightarrow HCOOH(aq) + HCHO(aq) + IO_3^-(aq)$$

In a typical experiment, a 1 mL solution of α-D-Glucopyranose required

80mL 0.25 M periodate solution to reach the equivalence point. The solution is made free from formic acid and iodate ion by extraction and then treated with H_2O_2, an oxidizing agent, oxidizing all formaldehyde into formic acid and finally titrated against 0.1 M NaOH solution. Titration required 40 mL of alkali to reach the equivalance point. Determine molarity of α-D-glucpyranose solution.

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350. Maximum mole of $Na_4\left[Cu_6(S_2O_3)_5\right]$ which can be produced by 6 moles of $CuSO_4$ and 10 moles of $Na_2S_2O_3$ using following series of reaction-

$$CuSO_4 + Na_2S_2O_3 \rightarrow CuS_2O_3 + Na_2SO_4$$

$$2CuS_2O_3 + Na_2S_2O_3 \rightarrow Cu_2S_2O_3 + Na_2S_4O_6$$

$$3Cu_2S_2O_3 + 2Na_2S_2O_3 \rightarrow Na_4\left[Cu_6(S_2O_3)_5\right]$$

Fill your answer to nearest integer.

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351. If average oxidation state of O in CrO_5 is 'x'. Then find out the value $|y|$. If $y = \mathrm{x} \times \frac{10}{3}$.

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352. A mixture of $H_2C_2O_4$ and $K_2C_2O_4$ required 0.2 N, 25mL $KMnO_4$ solution for complete oxidation. Same mixture needs 0.2 M,20 mL NaOH solution for its complete neutralisation. Calculate mole percentage of $H_2C_2O_4$ in the given mixture.

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353. The difference in the oxidation numbers of two types of sulphul atoms in $Na_2S_4O_6$ is.....

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354. Calculate volume (in mL) of 3 M $KMnO_4$ in acidified condition required to neutralize 20mL of 2.0 M $H_2C_2O_4.2KHC_2O_4.3FeC_2O_4$

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355. 6×10^{-3} mole $K_2Cr_2C_7$ reacts completely with 9×10^{-3} mole X^{n+} to give XO_3^- and Cr^{3+}. The value of n is :

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356. Find the number of electrons lost by $\frac{1}{6}$ molecule of caffine in the given combustion reaction.

$C_8H_{10}N_4O_2 + O_2 \rightarrow CO_2 + H_2O + NO_2$

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357. When 0.36 gm of iron pyrite (FeS_2) was heated strongly in air following reaction takes place

$FeS_2(s) + O_2(g) \rightarrow Fe_2O_3(s) + SO_2(g)$

The $SO_2(g)$ produced was titrated with acidified $K_2Cr_2O_7$ solution. Calculate the volume in mL of 1 M $K_2Cr_2O_7$ solution used in the redox titration. [Fe-56,S-32]

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358. Given balanced chemical equation for oxidation of phosphrous (III) sulphide by nitric acid. The products include NO and SO_2

$aP_4S_6 + 44H^+ + bNO_3^- \rightarrow cNO + dH_3PO_4 + eSO_2 + 4H_2O$

Find the value of (a=+b+c+d+e)

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