CHEMISTRY

BOOKS - PEARSON IIT JEE FOUNDATION

Language of Chemistry and Transformation of Substances

Concept Application Concept Application Level 1

1. Which of the following is not a physical change?

A. Dissolution of oxygen in water.

B. Dissolution of carbon dioxide in water.

C. Dissolution of alcohol in water

D. Dissolution of salt in water.

Answer: B::C

View Text Solution

2. Which of the following double displacement reactions is correct?

A. $AB + CD \rightarrow AC + BD$

B. $AB + CD \rightarrow AD + BC$

C. $AB + CD \rightarrow CA + BD$

D. $AB + CD \rightarrow AD + CB$

Answer: C::D

View Text Solution

3. The formula of th ephosphate of an element R is RPO_4, then the formulae of its hydroxide and sulphide respectively are _____are _____ .

A. $R(OH)_3$ and R_3S_2

B. $R(OH)_2$ and R_2S_3

C. $R(OH)_2$ and R_3S_2

D. $R(OH)_3$ and R_2S_3

Answer: C::D

Watch Video Solution

4. The molecular weight of a compound which contains a total number of five radicals is 160, then it is

A. Ca_3P_2

B. Fe_2O_3

C. Al_2O_3

D. Mg_3N_2

Answer: B::C

Watch Video Solution

5. Removal of CO_2 and H_2O from atmospheric air using KOH and anhydrous $CaCl_2$ is an example of _____ and _____ changes repectively.

A. chemical, chemical

B. physical, physical

C. chemical, physical

D. physical, chemical

Answer: C

Watch Video Solution

6. Which of the following reactions is a synthesis reaction?

A. When steam is passed over red hot coke, a mixture of carbon monoxide and hydrogen 15 fomed .

B. Sodium reacts with water co form sodium hydroxide and hydrogen .

C. When the milk of lime (calcium hydroxide) is added to hot sodium carbonate solution, sodium hydroxide is obtained and calcium carbonate separates out as mud.

D. Stannic chloride is perpared by passing chlorine into molten tin.

Answer: C::D

View Text Solution

7. $Pb(NO_3)_2 + Fe_2(SO_4)_3 \rightarrow Fe(NO_3)_3 + PbSO_4$

Coefficients of lead sulphate and ferric nitrate in the balanced equation of above reaction are

A. 3,4

B. 3,3

C. 3,2

D. 2,3

Answer: C

Watch Video Solution

8. The names of the salts formed by the reaction of

(i) Ca and HNO_3

Ca and H_2SO_3 are

A. (i) Calcium nitrate (ii) Calium sulphate

B. (i) Calcium nitrite (ii) Calcium sulphite

C. (i) Calcium nitrate (ii) Calcium sulphate

D. (i) Calcium nitrate (ii) Calcium sulphate

Answer: C

Watch Video Solution

9. The valency of nitride ion is same as the valency of _____ ion

A. Ferric

B. plumbic

C. zinc

D. calcium

Answer: A

Watch Video Solution

10. Removal of CO_2 and H_2O from atmospheric air using KOH and anhydrous $CaCl_2$ is an example of _____ and _____ changes repectively.

A. chcmical, chemical

B. physical, physical

C. chemical, physical

D. physical, chemical

Answer: C

Watch Video Solution

11. Reaction between barium chloride and aluminium sulphate is an example of

A. neutralisation reaction

B. displacement reaction

C. precipitation reaction.

D. combination reaction.

Answer: C

Watch Video Solution

12. Which among the following salts produces maximum number of metal ions per molecule when dissolved in a suitable solvent?

A. Aluminium phosphate $AIPO_4$

B. Magnesium phosphate $Mg(PO_4)_2$

C. Sodium biphosphate na_2HPO_4

D. Aluminium dihydrogen phosphate $Al(H_2PO_4)$

Answer: B

Watch Video Solution

13. A series of chemical reactions were carried out in a laboratory in the following way. At first zinc granules reacted withH_2SO_4 to form H_2 gas. Then hydrogen gas reacted with chlorine gas under diffused sunlight to form hydrogen chloride gas. Hydrogen chloride gas produced in this process was dissolved in water to form hydrochloric acid. Hydrochloric acid reacted with sodium hydroxide to form soruum chloride and water. Sodium chloride thus produced is first melted and then electricity is passed through it. Due to the passage of electricity through sodium chloride, sodium n1etal and chlorine gas is obtained.

Rahul was asked to arr:mge the above reactions in the order of

combination, decomposition, displacement and double decomposition.

His answer is given below.

(a) Formation of H_2 gas.

(b) Formation of hydrogen chloride gas.

(c) Formation of sodium and chlorine from sodium chloride.

(d) Fomation of sodium chloride.

Which among the following orders given below is correct, according to you?

A. c d b a

B. b c a d

C. a b c d

D. b c d a

Answer: B

View Text Solution

14. Arrange the following reactions in the given order, i.e., compound-element combination, compound-compound combination and element-element combination.

(1) Coke is burnt in an inadequate supply of air.

(2) The product formed in the reaction (1) is again burnt in the presence of oxygen.

(3) The product formed in the reaction (2) is treated with water.

A. a c b

B. b c a

C. b a c

D. c a b

Answer: B

Watch Video Solution

Concept Application Concept Application Level 2

1. An oxide X of carbon on treatment with oxygen gives Y which turns lime water milky and blue litmus to red. Predict the valencies of carbon in X and Y and what is the composition of milky precipitate formed?

Watch Video Solution

2. One molecule of a binary acid contains two hydrogen atoms and a negative radical X. What will be the formula of the salts when it reacts with bases, like, $M(OH)$, $M(OH)_2$ and $M(OH)_3$? Explain with reasons.

Watch Video Solution

3. The formula of hydrogen phosphate of a metal M is $MHPO_4$. Give the formula of its

(a) chloride

(b) bicarbonate

(c) sulphite

Watch Video Solution

4. Write the balanced chemical equation for the following.

(i) Potassium bromide on treatment with mangances dioxide and sulohuric acid gives manganese and potassium sulphates, bromine and water.

(ii) In the preparation of phosphate fertilizes, calcium phosphate in phosphate rock is converted into phosphoric acid and calcium sulphate.

(iii) Sodium nitrite is prodced by the reaction of the oxides of nitrogen in which nitrogen shows valency 2 and 4 in a solution of sodium carbonate.

View Text Solution

5. Nitrogen and oxygen react to produce nitric oxide. What is the weight of oxygen required to convert 4.9 g of nitrogen to nitric oxide ?

Watch Video Solution

6. The salt of an oxtacid of metal M contains two sulphur and six oxygen atoms. What will be the formula of the base formed by the metal and why?

View Text Solution

7. The molecular weight of a salt of oxy acid of chlorine of a dicalent metal which contains more number of oxygen atoms than its corresponding '-ic' acid is 239. What will the molecular weights of its (i) phosphate (ii) iodide (iii) bisulphatebe?

View Text Solution

8. Given below are three chemical equations. Study the equations and identufy the elements that show variable valency? Given reasons in support of your answer. ('M' and 'N' stand for different metals.)

(i) $Ms + ZnSO_4 \rightarrow MSO_4 + ZnS$

(ii) $3MCl_2 + N_2(SO_4)_3 \rightarrow 3MSO_4 + 2NCl_3$

(iii) $NS + H_2SO_4 \rightarrow NDO_4 + H_2S$

View Text Solution

9. Blue coloured $CuSO_4$ is taken in two test tubes A and B. Zinc granules are added to test tube A and small iron piecces are added to test tube B. Explain the observations in each acse by giving reasons.

Watch Video Solution

10. How do you account for the following ?

(1) Nitric acid is colourless but on long standing it turns yellow.

View Text Solution

11. In the welding of railway tracks, a proper proportion of aluminium powder and iron (iii) oxide are made to react with each other at high

temperature. Explain the type of reaction involved and also identify the reducing and the oxidizing agents.

Watch Video Solution

12. The valency of a metal is 2 and its atomic weight is 24. What will be the molecular weight of its

(a) sulphite (b) chloride (c) chloride?

Watch Video Solution

13. While balancing a chemical equation, only the coefficients of the formulae arc changed, but the subscnpts are not changed. Give reasons

View Text Solution

14. The chemical X is a hydroxide of a djvalent metal. On treating this hydroxide with CO_2 a milky white precipitate of Y is formed. The

precipitate turns to colourless solution by the excess passage of CO_2 This colourless solution again gives milky white precipitate 'Y' on heating. Identify X and Y and also give -necessary equations.

View Text Solution

15. A hydrocarbon on complete combustion produces 176 g of carbon dioxide and 90 g of water. What will x the formula of hydrocarbon be and also give balanced chemical equation of combustion of hydrocarbon?

View Text Solution

16. Heating and subsequent cooling of certain substances are given below. Classify them into either physical or che1nical change.

(a) Lead nitrate.

(b) Uluish green copper carbonate

(c) Yellow coloured Jead oxide

(d) White powdered zinc oxide

View Text Solution

17. Arrange the following radicals in the increasing order of total number of constituent atoms present in the respective radicals.

(a) hydroxide (b) nitride (c) chromate (d) sulphite (e) dihydrogen phosphate

Watch Video Solution

18. Two beakers A and B contain water. Glucose is added to beaker A and ammonia gas is passed through beaker B. What types of changes (physical or chemical) take place in the beakers? Justify.

Watch Video Solution

19. Oxide of a metal on treatment with water produces hissing sound and energy.The product (Y) formed on treatment with hydrochloric acid gives a solid 'X'. Identify the oxide, the product (Y) and X . Also write all the

balanced chemical equations and calculate molecular masses of the oxide, the product (Y) and X .

View Text Solution

20. A nonmetal X forms two oxides, A and B. The ratio of weight of the element X to the weight of oxygen in A and B is 7 : 20 and 7 : 16 respectively. If the molecular mass of the oxide, A is 1 08, identify A and B.

View Text Solution

21. Electrolysis of molten sodium chloride produces sodium and chlorine. Is this reaction a red.ox reaction? Give reasons in support of your ans\:ver.

View Text Solution

22. Two oxides of a metal contain 25.8% and 41.02% of oxygen by weight, respectively. Find the ratio of weights of metal combining with fixed

weight of oxygen?

Watch Video Solution

23. Express the following chemical changes in the form of chemical equations and identify what types of chemical reactions they are.

(a) A copper coin is placed in a solution of corrosive sublimate, mercuric chloride. The products obtained are cupric chloride and mercury. (b) A piece of (a) sulphur, (b) charcoal burns vigorously when dropped jn molten potassium nitrate, because potassium nitrate decomposes to form potassimn uitrite and oxygen and this oxygen helps to burn charcoal and sulphur giving out carbon dioxide and sulphurdioxide respectively.

(c) Aqueous anmonium hydroxide solution is made to react with aqueous copper sulphate solution and a bluish white precipitate of cupric hydroxide and ammonium sulphate are formed.

Watch Video Solution

24. (a) Decomposition reactions are always initiated with the supply of energy. Give appropriate reasons.

(b) Generally burning or combustion reactions are exothermic Justify.

View Text Solution

25. In the welding of railvvay tracks, a proper proportion of aluminium powder and iron (III) oxide arc made to react with each other at high temperature. Explain the type of reaction involved and also identify the reducing and the oxidizing agents.

View Text Solution

Concept Application Concept Application Level 3

1. What is the role of ultraviolet rays ip the purification of water in modern water purifiers?

View Text Solution

2. Under which condition does Bunsen burner produce a luminous flame and a non-luminous Harne? Give reasons in support of your answer.

View Text Solution

3. Anhydride of an acid X contains 2 phosphorous atoms, 5 oxygen atoms. If this acid X is made to react with bases like sodium hydroxide, calciurn hydroxide and aluminum hydroxide, what will the formulae of the corresponding normal salts formed be?

View Text Solution

4. A compound 'X ' of silver on treatment with barium chloride gives the respective products Y and Z . X on treatment with sodium hydroxide gives A and B where A can also be obtained when silver is attacked by ozone and Bis the salt of an oxy acid of nitrogen which ends with the suffix '-ate'. Identify and give the chemical formulae of the substances X ,Y, Z, A and B?

View Text Solution

5. The salt of hypohalous acid is prepared from the respective components namely halogen and the corresponding metallic hydroxide. The metal is the one which possesses the number of ckctrons in the ratio of 1 : 4 : 4 : 1 which corresponds to namely K, L, M, N shells respectively and the halogen is a greenish-yellow colour gas which can displace bromine from magnesium bromide. Identify the salt and the respective components.

View Text Solution

6. The molecular masses of sulphate and hydroxide of a metal M are 142 and 40 respectively. Calculate atomic mass and valency of the metal.

Watch Video Solution

7. What are the changes observed when moist sugar is treated with anhydrous calciurn chloride and concentrated H_2SO_4 respectively?

View Text Solution

8. Identify the type of chemical change that silver chloride undergoes in photo grey lenses.

Watch Video Solution

9. Blue coloured gas X having a characteristic fishy odour, can restore the colour of lead parntmgs. Thi.s gas X can also be used for sterilizing water. identify the gas X. Mention the type of reaction(s) involved.

Watch Video Solution

10. Fluorine is very reactive and attacks all metals but still a copper vessel is used in the preparation of fluorine gas. Why?

View Text Solution

Example

1. Calculate the total positive charge present on the positive radicals in the following compounds:

Calcium phosphide

Watch Video Solution

2. Calculate the total positive charge present on the positive radicals in the following compounds:

Magnesium nitrate

Watch Video Solution

3. Calculate the total positive charge present on the positive radicals in the following compounds:

Zinc sulphide

Watch Video Solution

4. Calculate the total positive charge present on the positive radicals in the following compounds:

Sodium zincate

Watch Video Solution

5. An oxyacid contains three hydrogen atoms, one phosphorus atom and four oxygen atoms.

Name the acid.

Watch Video Solution

6. An oxyacid contains three hydrogen atoms, one phosphorus atom and four oxygen atoms.

Name the different salts that can be formed by the acid on reaction with sodium hydroxide.

Watch Video Solution

7. An oxyacid contains three hydrogen atoms, one phosphorus atom and four oxygen atoms.

Calculate the molecular masses of the salts that can be formed on reaction with NaOH

Watch Video Solution

8. The valency of a metal 'M' is 2 and its atomic weight is 24. Calculate the molecular masses of its

sulphite

Watch Video Solution

Watch Video Solution

9. The valency of a metal 'M' is 2 and its atomic weight is 24. Calculate the molecular masses of its

chloride

Watch Video Solution

10. The valency of a metal 'M' is 2 and its atomic weight is 24. Calculate the molecular masses of its

chlorate

Watch Video Solution

11. In an acid-base neutralization reaction, the salt produced contains one metal atom (M), two nitrogen atoms and four oxygen atoms. Give the formulae of the acid and the base.

View Text Solution

12. A molecule of a binary salt contains two metal atoms and one sulphur atom. Determine the number of metal atoms present in one molecule of the binary salt formed by that metal and nitrogen? Give reasons in support of your answer.

Watch Video Solution

13. Two oxides of a metal contain 25.8% and 41.02% of oxygen by weight, respectively. Find the ratio of weights of metal combining with fixed weight of oxygen?

Watch Video Solution

14. The following reactions identify the products formed and balance the reaction.

$BaCl_2 + Na_2SO_4 \rightarrow$

Watch Video Solution

15. The following reactions identify the products formed and balance the reaction.

$2CuS + 3O_2 \rightarrow$

Watch Video Solution

16. The following reactions identify the products formed and balance the reaction.

$Na + H_2O \rightarrow$

Watch Video Solution

17. The following reactions identify the products formed and balance the reaction.

$2KI + Cl_2 \rightarrow$

Watch Video Solution

18. Nitric acid turns yellow on long standing. Explain

Watch Video Solution

19. Silverware tarnishes on exposure to polluted atmosphere. Give reason.

Watch Video Solution

20. The complete combustion of a hydrocarbon gives CO_2 and H_2O. In the balanced chemical equation, the coefficients of CO_2 and H_2O are 3 and 4, respectively. Find out the formula of the hydrocarbon.

Watch Video Solution

21. In the welding of railway tracks, a proper proportion of aluminium powder and iron (III) oxide is made to react with each other at high

temperature. Explain the type of reaction involved and also identify the reducing and the oxidizing agents.

View Text Solution

22. Mercury loses its lusture and sticks to the walls of the glass in the presence of ozone. Write the reasons and the possible reaction for this change.

Watch Video Solution

Test Your Concepts Very Short Answer Type Questions

1. Why is the burning of LPG a chemical change?

Watch Video Solution

2. The formula of ammonium bisulphate is _____

Watch Video Solution

3. Balance the chemical equations:

$As + HNO_3 \rightarrow NO_2 + H_3AsO_4 + H_2O$

Watch Video Solution

4. Balance the chemical equations:

$Cl_2 + SO_2 + H_2O \rightarrow H_2SO_4 + HCl$

Watch Video Solution

5. Balance the chemical equations:

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

Watch Video Solution

6. Balance the chemical equations:

$NH_3 + Br_2 \rightarrow N_2 + NH_4Br$

Watch Video Solution

7. Balance the chemical equations:

$KI + H_2SO_4 + MnO_2 \rightarrow KHSO_4 + MnSO_4 + H_2O + I_2$

Watch Video Solution

8. Balance the chemical equations:

$C_3H_8 + O_2 \rightarrow CO_2 + H_2O$

Watch Video Solution

9. Balance the chemical equations:

$CO_2 + H_2O \rightarrow C_6H_{12}O_6 + O_2$

Watch Video Solution

10. Balance the chemical equations:

$Fe_3O_4 + H_2 \rightarrow Fe + H_2O$

Watch Video Solution

11. Balance the chemical equations:

$Pb(NO_3)_2 \rightarrow PbO + NO_2 + O_2$

Watch Video Solution

12. Balance the chemical equations:

$Pb_3O_4 \rightarrow PbO + O_2$

Watch Video Solution

13. Balance the chemical equations:

$CuO + NH_3 \rightarrow Cu + H_2O + N_2$

Watch Video Solution

14. Balance the chemical equations:

$HNO_3 + C \rightarrow CO_2 + H_2O + NO_2$

Watch Video Solution

15. Balance the chemical equations:

$Na_2O_2 + H_2O \rightarrow NaOH + O_2$

Watch Video Solution

16. Balance the chemical equations:

$H_2S + FeCl_3 \rightarrow FeCl_2 + HCl + S$

Watch Video Solution

17. Balance the chemical equations:

$NaOH + Cl_2 \rightarrow NaCl + NaClO_3 + H_2O$

Watch Video Solution

18. Balance the chemical equations:

$K_2Cr_2O_7 + HCl \rightarrow KCl + CrCl_3 + H_2O + Cl_2$

Watch Video Solution

19. Balance the chemical equations:

$Ca(OH)_2 + NH_4Cl \rightarrow CaCl_2 + H_2O + NH_3$

Watch Video Solution

20. Balance the chemical equations:

$FeCl_3 + SO_2 + H_2O \rightarrow FeCl_2 + HCl + H_2SO_4$

Watch Video Solution

21. Balance the chemical equations:

$NH_3 + O_2 \rightarrow NO + H_2O$

Watch Video Solution

22. Balance the chemical equations:

$FeS_2 + O_2 \rightarrow Fe_2O_3 + SO_2$

Watch Video Solution

23. Balance the chemical equations:

$Ca_3(PO_4)_2 + SiO_2 + C \rightarrow CaSiO_3 + P_4 + CO$

Watch Video Solution

24. Balance the chemical equations:

$KMnO_4 + SO_2 + H_2O \rightarrow K_2SO_4 + MnSO_4 + H_2SO_4$

Watch Video Solution

25. Balance the chemical equations:

$Sn + HNO_3 \rightarrow Sn(NO_3)_2 + H_2O + NH_4NO_3$

Watch Video Solution

26. Balance the chemical equations:

$Al_2(SO_4)_3 + NaOH \rightarrow Na_2SO_4 + NaAlO_2 + H_2O$

Watch Video Solution

27. Balance the chemical equations:

$Al_4C_3 + H_2O \rightarrow Al(OH)_3 + CH_4$

Watch Video Solution

28. Balance the chemical equations:

$HI + HIO_3 \rightarrow I_2 + H_2O$

Watch Video Solution

29. Balance the chemical equations:

$Ca_3P_2 + H_2O \rightarrow Ca(OH)_2 + PH_3$

Watch Video Solution

30. Balance the chemical equations:

$S + HNO_3 \rightarrow H_2SO_4 + NO_2 + H_2O$

Watch Video Solution

31. Balance the chemical equations:

$I_2 + HNO_3 \rightarrow HIO_3 + NO_2 + H_2O$

Watch Video Solution

32. Balance the chemical equations:

$Na_2SO_2 + KMnO_4 + H_2SO_4 \rightarrow Na_2SO_4 + MnSO_4 + K_2SO_4 + H_2O +$

Watch Video Solution

33. Plumbous ion is represented as_____

Watch Video Solution

34. What is the difference between photochemical and thermochemical reactions?

Watch Video Solution

35. What is an inhibitor? What is the inhibitor used in the preparation of H_2SO_4?

Watch Video Solution

36. In the following table, some compounds are listed. In each case indentify the positive and negative radicals presents in the compound

S. No.	Compounds	Positive radicals	Negative radicals
(i)	SiO_2		
(ii)	CuS		
(iii)	H_2O_2		
(iv)	BaO_2		
(v)	MgS		
(vi)	$NaAlO_2$		
(vii)	MnO_2		
(viii)	LiH		
(ix)	$KMnO_4$		
(x)	$CaSiO_3$		
(xi)	CaF_2		
(xii)	HOCl		
(xiii)	$Ca(OCl)_2$		
(xvi)	H_2SO_3		
(xv)	KH_2PO_4		
(xvi)	K_2HPO_4		
(xvii)	H_2S		
(xviii)	H_2SO_3		
(xix)	$Mn(ClO_4)_2$		
(xx)	$Ba(OH)_2$		

Watch Video Solution

37. The compound SF6 is named as _____.

Watch Video Solution

38. For each of the following reactions identify the products formed and balance the reaction .

$NaCl + AgNO_3 \rightarrow$

Watch Video Solution

39. For each of the following reactions identify the products formed and balance the reaction .

$KOH + H_2SO_4 \rightarrow$

Watch Video Solution

40. For each of the following reactions identify the products formed and balance the reaction .

$H_2CO_3 \xrightarrow{\Delta}$

Watch Video Solution

41. For each of the following reactions identify the products formed and balance the reaction .

$KNO_3 + H_2SO_4 \rightarrow$

Watch Video Solution

42. For each of the following reactions identify the products formed and balance the reaction .

$HgO \xrightarrow{\Delta}$

Watch Video Solution

43. For each of the following reactions identify the products formed and balance the reaction .

$C_4H_{10} + O_2 \rightarrow$

Watch Video Solution

44. For each of the following reactions identify the products formed and balance the reaction .

$Na_2CO_3 + HCl \rightarrow$

Watch Video Solution

45. For each of the following reactions identify the products formed and balance the reaction .

$Zn + HCl \rightarrow$

Watch Video Solution

46. For each of the following reactions identify the products formed and balance the reaction .

$Ca(OH)_2 + H_2CO_3 \rightarrow$

Watch Video Solution

47. For each of the following reactions identify the products formed and balance the reaction .

$AgNO_3 + Cu \rightarrow$

Watch Video Solution

48. The following reactions identify the products formed and balance the reaction.

$BaCl_2 + Na_2SO_4 \rightarrow$

Watch Video Solution

49. The following reactions identify the products formed and balance the reaction.

$2CuS + 3O_2 \rightarrow$

Watch Video Solution

50. For each of the following reactions identify the products formed and balance the reaction .

$PbSO_4 + Na_2CO_3 \rightarrow$

Watch Video Solution

51. The following reactions identify the products formed and balance the reaction.

$Na + H_2O \rightarrow$

Watch Video Solution

52. For each of the following reactions identify the products formed and balance the reaction .

$KI + Cl_2 \rightarrow$

Watch Video Solution

53. For each of the following reactions identify the products formed and balance the reaction .

$CaCO_3 \xrightarrow{\Delta}$

Watch Video Solution

54. For each of the following reactions identify the products formed and balance the reaction .

$NaBr + Cl_2 \rightarrow$

Watch Video Solution

55. For each of the following reactions identify the products formed and balance the reaction .

$NaOH + HCl \rightarrow$

Watch Video Solution

56. For each of the following reactions identify the products formed and balance the reaction .

$Fe + Cl_2 \rightarrow$

Watch Video Solution

57. For each of the following reactions identify the products formed and balance the reaction .

$KCl + O_2 \rightarrow$

Watch Video Solution

58. Why is a physical change reversible?

Watch Video Solution

59. What is the difference between synthesis and analysis?

Watch Video Solution

60. The reaction $Fe + S \rightarrow FeS$ represents _____

Watch Video Solution

61. Why is the action of heat on iodine a physical change?

Watch Video Solution

62. What is meant by oxidation and reduction?

Watch Video Solution

63. What is the change that takes place when common salt is dissolved in water?

Watch Video Solution

64. Stibnum is the Latin name of_____ .

Watch Video Solution

65. Define an exothermic reaction. Give an example.

Watch Video Solution

66. $Ag + CuSO_4 \rightarrow Cu + AgSO_4$

Is this reaction possible ? Explain.

Watch Video Solution

67. Why do chemical reactions involve loss or gain of energy?

Watch Video Solution

68. What is meant by oxidation and reduction?

Watch Video Solution

69. When Fe^{+2} combines with O^{-2}, the compound obtained is _____

Watch Video Solution

70. What is a displacement reaction?

Watch Video Solution

71. What is chemical decomposition? Give one example.

Watch Video Solution

72. What are catalytic reactions? Give an example.

Watch Video Solution

73. Define endothermic reaction. Give one example.

Watch Video Solution

74. $N_2 + 3H_2 \rightarrow 2NH_3 + X$ kcal/mole, then the formation of NH_3 involves _____ of energy with respect to reactants.

Watch Video Solution

75. The symbols of carbon and cobalt are _____ and _____ respectively.

Watch Video Solution

76. The symbol S stands for _____

Watch Video Solution

Test Your Concepts Short Answer Type Questions

1. Burning of candle is an example of both physical and chemical changes. Justify your answer.

Watch Video Solution

2. What is chemical equation? W rite the steps involved in writing a chernical equation

Watch Video Solution

3. Write the differences between reduction and oxidation.

Watch Video Solution

4. To obtain hydrogen and oxygen from water, what are the conditions to be maintained?

What are the different names that can be given to this reaction?

Watch Video Solution

5. Why are the double decomposition rcac:Lions also called double dispbcement reactions?

Watch Video Solution

6. Write the steps in naming a binary compound formed by two non-metallic ekmcnts, except hydrogen, with the help of an example .

Watch Video Solution

7. Write the steps in naming a base.

Watch Video Solution

8. $Fe_3O_4 + 4H_2 \rightarrow 3Fe + 4H_2O$

$2Na + Cl_2 \rightarrow 2NaCl$. Indentify the oxidizing agent in the given reactions.

Watch Video Solution

9. Photolysis comes under which type of chemical reaction? Explain it with an example.

Watch Video Solution

10. Classify the following equations into combination, displacement, decomposition and double displacement.

(i) $NH_4Cl \rightarrow NH_3 + HCl$

(ii) $2NO + O_2 \rightarrow 2NO_2$

(iii) $ZnCO_3 \rightarrow ZnO + CO_2$

(iv) $Ag_2SO_4 + 2FeSO_4 \rightarrow Ag + Fe_2(SO_4)_3$

(v) $2NH_3 \rightarrow N_2 + 3H_2$

(vi) $AgNO_3 + HCl \rightarrow AgCl + NaNO_3$

(vii) $2SO_2 + O_2 \rightarrow 2SO_3$

Watch Video Solution

11. Write the characteristics of a chemical reaction.

Watch Video Solution

12. Classify the following into physical and chemical changes.

freezing of water

Watch Video Solution

13. Classify the following into physical and chemical changes.

fermentation of alcohol

Watch Video Solution

14. Classify the following into physical and chemical changes.

burning of coal

Watch Video Solution

15. Classify the following into physical and chemical changes.

breaking of glass

Watch Video Solution

16. Classify the following into physical and chemical changes.

glowing of an electric bulb

Watch Video Solution

17. Why do we need to use formulae?

Watch Video Solution

18. Write the steps in naming oxyacids with greater number of oxygen atoms

Watch Video Solution

19. Write the steps in naming oxyacids with less number of oxygen atoms.

Watch Video Solution

20. Explain the law of definite proportions with an example

Watch Video Solution

21. Give the differences between oxidation and reduction in terms of oxygen, hydrogen, electropositive element and electronegative element.

Watch Video Solution

22. What is a decomposition reaction? Explain different decomposition reactions with equations.

Watch Video Solution

23. What is a chemical combination reaction? Explain the different types of combination reactions.

Watch Video Solution

24. State the law of multiple proportion with example.

Watch Video Solution

Watch Video Solution

Concept Application Level 1 State Whether The Following Statements Are True Or False

1. Formula for potassium biphosphate is $KHPO_4$.

Watch Video Solution

2. The compounds H_2O and D_2O follows Law of multiple proportions.

Watch Video Solution

3. A_2X is comprised of two divalent negative radicals and one monovalent positive radical.

Watch Video Solution

4. Formation of sodiurn nitrite and oxygen by thermal decornposition of sodiurn nitrate involves only chemical change.

Watch Video Solution

5. The reaction $C + O_2 \rightarrow CO$, follows the law of conservation of mass.

Watch Video Solution

6. Valency of sulphur in SO_2 is 2.

Watch Video Solution

7. In exothermic reactions, the energy of products is more than the energy of reactants.

Watch Video Solution

Concept Application Level 1 Fill In The Blanks

1. The valencies of sulphur in hydrogen sulphide and sulphur dioxide are_____ and _____ , respectively.

Watch Video Solution

2. When 58 g of $Mg(OH)_2$ reacts with 98 g of H_2SO_4, it gives 36 g of H_2O and of $MgSO_4$.

Watch Video Solution

3. If the molecular weight of a compound Na_XSO_Y is 142, then the values of X and Y are, respectively, _____ and _____

Watch Video Solution

4. In $Sn + HNO_3 \rightarrow Sn(NO_3)_2 + H_2O + NH_4NO_3$, the valencies of Sn are_____

Watch Video Solution

5. In binary compounds, the suffix_____ is added to the second element.

Watch Video Solution

6. The symbol of the element _____ is F.

Watch Video Solution

7. The reverse reaction of neutralization is _____ .

Watch Video Solution

Concept Application Level 1 Match The Entries Given In Column A With Appropriate Ones In Column B

1. Match the entries given in Column A with appropriate ones in Column B.

Column A		Column B
A. 2H	( )	a. 9 Nitrogen atoms
B. 3CO	( )	b. 9 Sodium atoms
C. 4 H_2O	( )	c. 5 Hydrated copper sulphate molecules
D. $2H_2$	( )	d. 4 Water molecules
E. 9Na	( )	e. 3 Cobalt atoms
F. $8Cl^{-1}$	( )	f. 2 Hydrogen atoms
G. 9 N	( )	g. 3 Carbon monoxide molecules
H. $9Na^{+1}$	( )	h. 2 Hydrogen molecules
I. 3Co	( )	i. 8 Chloride radicals
J. $5CuSO_4\ 5H_2O$	( )	j. 9 Sodium ions

Watch Video Solution

Concept Application Level 1 Select The Correct Alternative

1. Which of the following is not a physical change?

A. dissolution of oxygen in water

B. dissolution of carbon dioxide in water

C. dissolution of alcohol in water

D. dissolution of salt in water

Answer: B

Watch Video Solution

2. Which of the following double displacement reactions is correct?

A. $AB + CD \rightarrow AC + BD$

B. $AB + CD \rightarrow AD + BC$

C. $AB + CD \rightarrow CA + BD$

D. $AB + CD \rightarrow AD + CB$

Answer: C

View Text Solution

3. The formula of th ephosphate of an element R is RPO_4, then the formulae of its hydroxide and sulphide respectively are _____are _____ .

A. $R(OH)_3$ and R_3S_2

B. $R(OH)_2$ and R_2S_3

C. $R(OH)_2$ and R_3S_2

D. $R(OH)_3$ and R_2S_3

Answer: C

Watch Video Solution

4. The molecular weight of a compound which contains a total number of five radicals is 160, then it is

A. Ca_3P_2

B. Fe_2O_3

C. Al_2O_3

D. Mg_3N_2

Answer: B

Watch Video Solution

5. Removal of CO_2 and H_2O from atmospheric air using KOH and anhydrous $CaCl_2$ is an example of _____ and _____ changes repectively.

A. chemical, chemical

B. physical, physical

C. chemical, physical

D. physical, chemical

Answer: C

Watch Video Solution

6. Which of the following reactions is a synthesis reaction?

A. When steam is passed over red hot coke, a mixture of carbon monoxide and hydrogen is formed.

B. Sodium reacts with water to form sodium hydroxide and hydrogen.

C. When the milk of lime (calcium hydroxide) is added to hot sodium carbonate solution, sodium hydroxide is obtained and calcium carbonate separates out as mud.

D. Stannic chloride is prepared by passing chlorine into molten tin.

Answer: C

View Text Solution

7. $Pb(NO_3)_2 + Fe_2(SO_4)_3 \rightarrow Fe(NO_3)_3 + PbSO_4$

Coefficients of lead sulphate and ferric nitrate in the balanced equation of the above reaction are

A. 3, 4

B. 3,3

C. 3,2

D. 2, 3

Answer: C

Watch Video Solution

8. The names of the salts formed by the reaction of

(i) Ca and HNO_3

Ca and H_2SO_3 are

A. (i) calcium nitrate (ii) calcium sulphate

B. (i) calcium nitrite (ii) calcium sulphite

C. (i) calcium nitrate (ii) calcium sulphite

D. (i) calcium nitrite (ii) calcium sulphate

Answer: C

Watch Video Solution

9. A, B and C are the elements such that A on reaction with air produces a dazzling white flame, B is used in rubber industry for hardening and acts as a conductor with rise in temperature. Then A, B and C are

A. metals

B. metal, and non-metal, respectively

C. non-metal, metal and metalloid, respectively

D. metal, non-metal and metalloid, respectively

Answer: C

View Text Solution

10. In the preparation of H_2SO_4 the catalyst and the inhibitor, respectively, are

A. platinum, molybdenum

B. iron, arsenic oxide

C. platinum, arsenic oxide

D. iron, molybdenum

Answer: C

Watch Video Solution

11. $Fe_2O_3 + 3C \rightarrow 2Fe + 3CO$, in this reaction

A. Fe undergoes oxidation and C undergoes reduction

B. Fe undergoes reduction and C undergoes oxidation

C. both Fe and C undergo reduction

D. both Fe and C undergo oxidation

Answer: B

Watch Video Solution

12. Arrange the elements Zn, Sn, Ca and Al in the increasing order of their reactivity for replacing Cu from $CuSO_4$ solution:

A. $Zn > Sn > Ca > Al$

B. $Ca > Al > Zn > Sn$

C. $Ca > Al > Sn > Zn$

D. $Ca > Sn > Zn > Al$

Answer: B

Watch Video Solution

13. The valency of sulphate radical is equal to the valency of

A. phosphate radical

B. hydrogen phosphate radical

C. dihydrogen phosphate radical

D. phosphide radical

Answer: B

Watch Video Solution

14. The ratio of oxygen atoms present in one molecule of cupric nitrite and ferric sulphite is

A. $4:9$

B. $2:3$

C. $1:2$

D. $1:3$

Answer: A

Watch Video Solution

15. Which of the following statements is false?

A. A catalyst is highly specific.

B. The percentage of yield of products can be influenced by a catalyst.

C. All catalysts have a large surface area.

D. Composition of a catalyst changes during the reaction.

Answer: B

Watch Video Solution

16. Which one of the following is the salt of a binary acid?

A. calcium sulphate

B. magnesium bromide

C. zinc phosphate

D. sodium carbonate

Answer: B

Watch Video Solution

17. Which of the following is a salt of 'ous' acid?

A. Na_2SO_4

B. $NaNO_3^+$

C. $NaClO_2$

D. $NaClO_4$

Answer: C

Watch Video Solution

18. Arrange the following compounds in the order of valency of a positive radical.

(i) $A(H_2PO_4)_2$

(ii) B_2O (iii) $C_2(SO_4)_3$

A. (iii) $>$ (i) $>$ (ii)

B. (iii) $>$ (ii) $>$ (i)

C. (ii) $>$ (i) $>$ (iii)

D. $(i) > (ii) > (iii)$

Answer: A

Watch Video Solution

19. The name of a substance is given to a student. He was asked to write its formula. What is the systematic method to be followed to derive the formula? Arrange the given statements in a proper sequence to obtain the formula.

(1) Symbol of positive ion or radical should be placed to the left-hand side and symbol of negative ion should be placed to the right-hand side.

(2) Place the valency with charge of respective radicals on the top right hand corner of their symbols.

(3) Write the symbols of the respective ions or radicals present in the given compound.

(4) Criss-cross the valency on the lower right hand side of ions/radicals.

(5) A radical consisting of more than one element has to be enclosed within the brackets if the respective number attained in criss-cross is more than one.

(6) No space should be left in between oppositely charged ions while writing the formula.

A. 3 1 2 4 5 6

B. 4 3 6 2 5 1

C. 4 1 3 2 4 6

D. 5 6 4 2 1 3

Answer:

Watch Video Solution

20. The different samples of CO_2 were found to contain carbon and oxygen in the same ratio of their mass. This illustrates

A. law of conservation of mass

B. law of definite proportions

C. law of multiple proportions

D. law of reciprocal proportions

Answer:

Watch Video Solution

21. When the reaction, $Pb(NO_3)_2 \rightarrow PbO + NO_2 + O_2$ is balanced, the coefficients of $Pb(NO_3)_2, PbO$ and NO_2 are _____,_____and _____ respectively.

A. 2, 2 and 2

B. 2, 4 and 4

C. 4, 2 and 4

D. 2, 2 and 4

Answer:

Watch Video Solution

22. The reaction $Hg + S \rightarrow HgS$ represents a - as well as a _____ reaction.

A. combination, synthesis

B. combination, analysis

C. decomposition, analysis

D. decomposition, synthesis

Answer:

Watch Video Solution

23. The reaction $NaOH + HCl \rightarrow NaCl + H_2O$

A. follows law of conservation of mass

B. is a neutralization reaction

C. is a precipitation reaction

D. Both (a) and (b)

Answer:

Watch Video Solution

24. The formation of sulphur trioxide from sulphur dioxide and oxygen is an reaction.

A. endothermic as well as redox

B. endothermic as well as precipitation

C. exothermic as well as redox

D. exothermic as well as precipitation

Answer:

Watch Video Solution

25. The valency of nitride ion is same as the valency of _____ ion

A. ferric

B. plumbic

C. zinc

D. calcium

Answer:

Watch Video Solution

26. Removal of CO_2 and H_2O from atmospheric air using KOH and anhydrous $CaCl_2$ is an example of _____ and _____ changes repectively.

A. chemical, chemical

B. physical, physical

C. chemical, physical

D. physical, chemical

Answer:

Watch Video Solution

27. Reaction between barium chloride and aluminium sulphate is an example of

A. neutralization reaction

B. displacement reaction

C. precipitation reaction

D. combination reaction

Answer:

Watch Video Solution

28. Which among the following salts produces maximum number of metal ions per molecule when dissolved in a suitable solvent?

A. aluminium phosphate, $AlPO_4$

B. magnesium phosphate, $Mg_3(PO_4)_2$

C. sodium biphosphate, Na_2HPO_4

D. aluminium dihydrogen phosphate, $Al(H_2PO_4)$

Answer:

Watch Video Solution

29. A series of chemical reactions were carried out in a laboratory in the following way. At first zinc granules reacted with H_2SO_4 to form H_2 gas. Then hydrogen gas reacted with chlorine gas under diffused sunlight to form hydrogen chloride gas. Hydrogen chloride gas produced in this process was dissolved in water to form hydrochloric acid. Hydrochloric acid reacted with sodium hydroxide to form sodium chloride and water. Sodium chloride, thus, produced is first melted and then electricity is passed through it. Due to the passage of electricity through sodium chloride, sodium metal and chlorine gas are obtained. Rahul was asked to arrange the above reactions in the order of combination, decomposition, displacement and double decomposition.

His answer is given below.

(1) formation of H_2 gas

(2) formation of hydrogen chloride gas

(3) formation of sodium and chlorine from sodium chloride

(4) formation of sodium chloride Which among the following orders given below is correct, according to you?

A. 3 4 2 1

B. 2 3 1 4

C. 1 2 3 4

D. 2 3 4 1

Answer:

View Text Solution

30. Arrange the following reactions in the given order, i.e., compound-element combination, compound-compound combination and element-element combination.

(1) Coke is burnt in an inadequate supply of air.

(2) The product formed in the reaction (1) is again burnt in the presence of oxygen.

(3) The product formed in the reaction (2) is treated with water.

A. 1 3 2

B. 2 3 1

C. 2 1 3

D. 3 1 2

Answer:

Watch Video Solution

Concept Application Level 2

1. An oxide X of carbon on treatment with oxygen gives Y which turns lime water milky and blue litmus to red. Predict the valencies of carbon in X and Y and what is the composition of milky precipitate formed?

Watch Video Solution

2. One molecule of a binary acid contains two hydrogen atoms and a negative radical X. What will be the formula of the salts when it reacts with bases, like, $M(OH)$, $M(OH)_2$ and $M(OH)_3$? Explain with reasons.

Watch Video Solution

3. The formula of hydrogen phosphate of a metal M is $MHPO_4$. Give the formula of its

(a) chloride

(b) bicarbonate

(c) sulphite

Watch Video Solution

4. Write the balanced chemical equation for the following:

Potassium bromide on treatment with manganese dioxide and sulphuric acid gives manganese and potassium sulphates, bromine and water.

Watch Video Solution

5. Write the balanced chemical equation for the following:

In the preparation of phosphate fertilisers, calcium phosphate in

phosphate rock is converted into phosphoric acid and calcium sulphate.

Watch Video Solution

6. Write the balanced chemical equation for the following:

Sodium nitrite is produced by the reaction of the oxides of nitrogen in which nitrogen shows valency 2 and 4 in a solution of sodium carbonate.

Watch Video Solution

7. Nitrogen and oxygen react to produce nitric oxide. What is the weight of oxygen required to convert 4.9 g of nitrogen to nitric oxide ?

Watch Video Solution

8. The salt of an oxyacid of metal M contains two sulphur and six oxygen atoms. What will be the formula of the base formed by the metal and why?

View Text Solution

9. The molecular weight of a salt of oxyacid of chlorine of a divalent metal which contains more number of oxygen atoms than its corresponding 'ic acid is 239. What will be the molecular weights of its (i) phosphate, (ii) iodide and (iii) bisulphate?

View Text Solution

10. Given below are three chemical equations. Study the equations and identify the elements that show variable valency? Give reasons in support of your answer. ("M'and 'N' stand for different metals.)

(i) $MS + ZnSO_4 \rightarrow MSO_4 + ZnS$

(ii) $3MCl_2 + N_2(SO_4)_3 \rightarrow 3MSO_4 + 2NCl_3$

(iii) $NS + H_2SO_4 \rightarrow NSO_4 + H_2S$

View Text Solution

11. Blue coloured $CuSO_4$ is taken in two test tubes A and B. Zinc granules are added to test tube A and small iron piecces are added to test tube B. Explain the observations in each acse by giving reasons.

Watch Video Solution

12. How do you account for the following?

Nitric acid is colourless but on long standing it turns yellow.

View Text Solution

13. How do you account for the following?

Hydrochloric acid can be concentrated by conc. H_2SO_4 but not by phosphorous pentoxide (or) quick lime.

Watch Video Solution

14. In the welding of railway tracks, a proper proportion of aluminium powder and iron (iii) oxide are made to react with each other at high temperature. Explain the type of reaction involved and also identify the reducing and the oxidizing agents.

Watch Video Solution

15. The valency of a metal is 2 and its atomic weight is 24. What will be the molecular weight of its

(a) sulphite (b) chloride (c) chloride?

Watch Video Solution

16. While balancing a chemical equation, only the coefficients of the formulae are changed, but the subscripts are not changed. Give reasons.

Watch Video Solution

17. The chemical X is a hydroxide of a divalent metal. On treating this hydroxide with CO_2, a milky white precipitate of Y is formed. The precipitate turns to colourless solution by the excess passage of CO_2. This colourless solution again gives milky white precipitate Y on heating. Identify X and Y and also give necessary equations.

Watch Video Solution

18. A hydrocarbon on complete combustion produces 176 g of carbon dioxide and 90 g of water. What will x the formula of hydrocarbon be? Also give balanced chemical equation of combustion of hydrocarbon

View Text Solution

19. Heating and subsequent cooling of certain substances are given below. Classify them into either physical or chemical change.

(a) lead nitrate

(b) bluish green copper carbonate

(c) yellow coloured lead oxide

(d) White powdered zinc oxide

View Text Solution

20. Arrange the following radicals in the increasing order of total number of constituent atoms present in the respective radicals.

(a) hydroxide (b) nitride (c) chromate (d) sulphite (e) dihydrogen phosphate

Watch Video Solution

21. Two beakers A and B contain water. Glucose is added to beaker A and ammonia gas is passed through beaker B. What types of changes (physical or chemical) take place in the beakers? Justify.

Watch Video Solution

22. Oxide of a metal on treatment with water produces a hissing sound and energy. The product (Y) formed on treatment with hydrochloric acid gives a solid X. Identify the oxide, the product (Y) and X. Also write all the balanced chemical equations and calculate molecular masses of the oxide, the product Y and X

Watch Video Solution

23. A non-metal X forms two oxides, A and B. The ratio of weight of the element X to the weight of oxygen in A and B is 7:20 and 7: 16, respectively. If the molecular mass of the oxide, A is 108, identify A and B.

View Text Solution

24. Electrolysis of molten sodium chloride produces sodium and chlorine. Is this reaction a redox reaction? Give reasons in support of your answer.

View Text Solution

25. Express the following chemical changes in the form of chemical equations and identify what types of chemical reactions they are.

A copper coin is placed in a solution of corrosive sublimate, mercuric chloride. The products obtained are cupric chloride and mercury.

Watch Video Solution

26. Express the following chemical changes in the form of chemical equations and identify what types of chemical reactions they are.

A piece of (a) sulphur and (b) charcoal burns vigorously when dropped in molten potassium nitrate, because potassium nitrate decomposes to form potassium nitrite and oxygen and this oxygen helps to burn charcoal and sulphur giving out carbon dioxide and sulphur dioxide, respectively.

Watch Video Solution

27. Express the following chemical changes in the form of chemical equations and identify what types of chemical reactions they are.

Aqueous ammonium hydroxide solution is made to react with aqueous copper sulphate solution and a bluish white precipitate of cupric hydroxide and ammonium sulphate are formed.

Watch Video Solution

28. Decomposition reactions are always initiated with the supply of energy. Give appropriate reasons.

Watch Video Solution

29. Generally, burning or combustion reactions are exothermic. Justify.

Watch Video Solution

30. In the welding of railway tracks, a proper proportion of aluminium powder and iron (iii) oxide are made to react with each other at high temperature. Explain the type of reaction involved and also identify the reducing and the oxidizing agents.

Watch Video Solution

Concept Application Level 3

1. What is the role of ultraviolet rays in the purification of water in modern water purifiers?

View Text Solution

2. Under which condition does Bunsen burner produce a luminous flame and a non-luminous flame? Give reasons in support of your answer.

View Text Solution

3. Anhydride of an acid X contains 2 phosphorous atoms and 5 oxygen atoms. If this acid X is made to react with bases, like, sodium hydroxide, calcium hydroxide and aluminium hydroxide, what will be the formulae of the corresponding normal salts formed?

View Text Solution

4. A compound X of silver on treatment with barium chloride gives the respective products Y and Z. X on treatment with sodium hydroxide gives A and B where A can also be obtained when silver is attacked by ozone and B is the salt of an oxyacid of nitrogen which ends with the suffix 'ate.' Identify and give the chemical formulae of the substances X, Y, Z, A and B.

View Text Solution

5. The salt of hypohalous acid is prepared from the respective components, namely, halogen and the corresponding metallic hydroxide.

The metal is the one which possesses the number of electrons in the ratio of 1: 4:4:1 which corresponds to, namely, K, L, M and N shells, respectively, and the halogen is a greenish-yellow colour gas which can displace bromine from magnesium bromide. Identify the salt and the respective components.

View Text Solution

6. The molecular masses of sulphate and hydroxide of a metal M are 142 and 40 respectively. Calculate atomic mass and valency of the metal.

Watch Video Solution

7. What are the changes observed when moist sugar is treated with anhydrous calcium chloride and concentrated H_2SO_4 respectively?

View Text Solution

8. Identify the type of chemical change that silver chloride undergoes in photo grey lenses.

Watch Video Solution

9. Blue-coloured gas X having a characteristic fishy odour, can restore the colour of lead paintings. This gas can also be used for sterilizing water. Identify the gas X. Mention the type of reaction(s) involved.

View Text Solution

10. Fluorine is very reactive and attacks all metals but still a copper vessel is used in the preparation of fluorine gas. Why?

Watch Video Solution