CHEMISTRY

BOOKS - S CHAND CHEMISTRY (HINGLISH)

METALS AND NON-METALS

Solved Examples

1. Between copper and sodium, which metal is more reactive? Explain with reason

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2. In a solution of silver nitrate, a copper plate was dipped. After some time, silver from the solution was deposited on the copper plate. Which metals is more reactive-copper or silver?

how?

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3. A solution of $CuSO_4$ was kept in an iron pot. After few days the iron pot was found to have a number of holes in it. Explain the reason in terms of reactivity. Write the equation of the reaction involved.

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4. What would you observe when zinc is added to a solution of iron (II) sulphate?

Write the chemical reaction that takes place.

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5. Metallic oxides of zinc, magnesium and copper were heated with the following metals.

Metal	Zinc	Magnesium	Copper
Zinc oxide			
Magnesium oxide			
Copper oxide			

In which cases will you find displacement reactions taking place?

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6. Samples of four metals A, B, C and D were taken and added to the following solution one by one. The results obtained have been tabulated as follows.

Metal	Iron(II) sulphate	Copper(II) sulphate	Zinc sulphate	Silver nitrate
A	No reaction	Displacement		
B	Displacement		No reaction	
C	No reaction	No reaction	No reaction	Displacement
D	No reaction	No reaction	No reaction	No reaction

Use the Table above to answer the following questions about metals A, B, C and D.

(i) Which is the most reactive metal?

(ii) What would you observe if B is added to a solution of Copper (II) sulphate?

(iii) Arrange the metals A, B, C and D in the order of decreasing reactivity.

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7. From amongst the following, choose the metals and non-metals and state one of the properties on the basis of which you have made you choice.

(i). Graphite

(ii). Sodium

(iii). Phosphorus

(iv). Helium.

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8. An element reacts with oxygen to form an oxide which dissolves in dilute hydrochloric acid. The oxide formed also turns a solution of red litmus blue. Is the element a metal or a non-metal? Explain your answer.

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9. Which of the following elements would iield a basic oxide?

S, P, Ca, Si

A. S

B. P

C. Ca

D. Si

Answer: C

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10. Name two metals which will displace hydrogen from dilute acids, and two metals which will not.

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11. Pratyush took sulphur powder on a spatula and heated it. He collected the gas evolved by inverting a test tube over it, as shown in figure below.

(a) What will be the action of gas on

(i) dry litmus paper?

(ii) moist litmus paper?

(b) Write a balanced chemical equation for the reaction taking place.

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12. (i) Write the electron-dot structures for sodium, oxygen and magnesium.

(ii) Show the formation of Na_2O and M_gO by the transfer of electrons.

(iii) What are the ions present in these compounds?

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13. Explain the nature of the covalent bond using the bond formation in CH_3Cl.

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14. Draw the electron-dot structures for

(a). H_2S

(b). F_2

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15. What would be the electron dot structure of a molecule of sulphur which is made up of eight atoms of sulphur? (Hint – the eight atoms of sulphur are joined together in the form of a ring.)

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16. In the formation of the compound AB, atoms of A lost one electron each while stoms of B gained one electron each. What is the nature of bond in AB? Predict the two properties of AB.

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17. An element A has 4 electrons in the outermost shell of its atom and combines with another element B having 7 electrons in the

outermost shell of its atom. The compound formed does not conduct electricity. What is the nature of the chemical bond in the compound ? Give the electron-dot structure of its molecule.

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18. Give the formulae of the chlorides of the elements A and B having atomic numbers of 6 and 11 respectively. Wil the properties of the two chlorides be similar or different? Explain.

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19. An ore gives carbon dioxide on treatment with a dilute acid. What steps will you take to convert such a concentrated ore into free metal?

A. Calcination then oxidation

B. Calcination then reduction

C. Oxidation then Calcination

D. Reduction then calcination

Answer: B

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20. Which of the following methods is suitable for preventing an iron frying pan from rusting?

A. Applying greese

B. Applying paint

C. Applying coating of zinc

D. All of the above

Answer: C

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21. Food cans are coated with tin and not with zinc because

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22. You must have seen tarnished copper vessels being cleaned with lemon or tamarind

juice. Explain why these sour substances are effective in cleaning the vessels.

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23. A woman gave old and dull gold bangles to a goldsmith for polishing to restore their glitter. The goldsmith dipped the gold bangles in a particlular solution. The bangles sparkled like new but their weight was reduced drastically. Can you guess the solution used by the dishonest gold smith.?

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Solved Problem

1. Which of the following pairs will give displacement reactions?

(a). NaCl solution and copper metal

(b). $MgCl_2$ solution and aluminium metal.

(c). $FeSO_4$ solution and silver metal.

(d). $AgNO_3$ solution and copper metal.

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Exercise

1. Name one metal and non - metal which exist as liquids at room temperature .

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2. why are metals called electropositive elements whereas non-metals are called electronegative elements?

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3. (a) Name the most abundant metal in the earth's crust.

(b). Name the most abundant non-metal in the earth's crust.

4. Name ore metal which has a low melting point.

5. Name the metal which is the poorest conductor of heat.

A. Sodium

B. Potassium

C. Copper

D. Bismuth

Answer: D

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6. State whether the followign statement is true of false:

Non-metals react with dilute acids to procue a gas which burns with a 'pop' sound.

A. True

B. False

C. Can not predict

D. None of the above

Answer: B

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7. From amongst the metals sodium, calcium, aluminium, copper and magnesium, name the metal (i). Which reacts with water only on boiling, and (ii). Another which does not react even with steam.

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8. What changes in the colour of iron nails and copper sulphate solution do you observe after

keeping the iron nails dipped in copper sulphate solution for about 30 minutes?

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9. What is aqua-regia? Name two special metals which are insoluble in common reagents but dissolve in aqua-regia.

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10. Give the names and formulae of (a) two acidic oxides, and (b) two basic oxides.

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11. What name is given to those metal oxides which show basic as well as acidic behaviour?

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12. Name two metals which form amphoteric oxides.

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13. A copper coin is kept immersed in a solution of silver nitrate for some time. What will happen to the coin and the colour of the solution?

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14. Which property of copper and aluminium makes them suitable:

(a). For making cooking utensils and boilers?

(b). For making electric wires?.

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15. Write the name and formulae of (a) a metal hydride, ad (b) a non-metal hydride.

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16. Name the metal which has been placed:

(a). At the bottom of the reactivity series.

(b). At the top of the reactivity series.

(c). Just below copper int eh reactivity series.

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17. Which of the two metals is more reactive: copper or silver?

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18. (a). Name one metal which is stored in kerosene oil.

(b). Name one non-metal which is stored under water.

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19. Write equation for the reaction of

(a). Sodium with oxygen

(b) magnesium with oxygen

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20. Name two metals which are used:

(a). For making electric wires

(b). For making domestic utensils and factory equipment.

(c). For making jewellery and to decorate sweets.

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21. Which metal foil is used for packing some of the medicine tables.?

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22. Name the non-metal which is used:

(a). To convert vegetable oil into vegetable ghee (solid fat)

(b). As a rocket fuel (in liquid form).

(c). To make electrodes of dry cells

(d). To preserve food materials.

(e). In the vulcanisation of rubber.

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23. Name one property which is characteristic of (a) metals, and (b) non-metals.

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24. What is meant by "brittleness"? Which type of elements usually show brittleness: metals or non-metals ?

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25. What will happen if a strip of zinc is immersed in a solution of copper sulphate?

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26. What will happen if a strip of copper is kept immersed in a solution fo silver nitrate $(AgNO_3)$?

A. Cu displaces Ag from its solution

B. $Cu(NO_3)_2$ is formed

C. No reaction takes place

D. Both a and b

Answer: D

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27. What happens when iron nails are put into copper sulphate solution?

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28. How would you show that silver is chemically less reactive than copper?

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29. Give reasons for the following:

Blue colour of copper sulphate solution is destroyed when iron filings are added to it.

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30. Name a non-metal having a very high melting point.

A. Graphite

B. Bromine

C. Sodium

D. Potassium

Answer: A

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31. Which property of graphite is utilised in making electrondes?

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32. Name two non-metals which are both brittle and non-ductile.

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33. Explain why, the surface of some metals acquires a dull appearance when exposed to

air for a long time.

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34. Complete and balance the following equations:

(a). $Na + O_2 \rightarrow$

(b). $Na_2O + H_2O \rightarrow$

(c). $Fe(s) + H_2O(g) \xrightarrow{\text{Red heat}}$

(d). $Cu(NO_3)_2(aq) + Zn(s) \rightarrow$

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35. Fill in the following blanks with suitable words:

(a). Magnesium liberates____gas on reacting with hot boiling water.

(b). The white powder formed when magnesium ribbon burns in oxygen is of_____

(c). Ordinary aluminium strips are not attacked by water because of the presence of a layer of _____ on the surface of aluminium.

(d). A metal having low melting point is____ but a non-metal having very high melting point is____

(e). Calcium is a _____reaactive metal than sodium.

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36. (a). What is meant by saying that the metals are malleable and ductile ? Explain with examples.

(b). Name two metals which are both malleable and ductile.

(c). Which property of iron metal is utilised in producing iron sheets required for making

buckets ?

(d). Which property of copper metal is utilised in making thin wires ?

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37. Name two metals which react vilently with cold water. Write any three observations you would make when such a metal is dropped into water. How would you identify the gas evolved, if any during the reaction?

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38. (a). With the help of examples, describe how metals oxides differ from non-metal oxides.

(b). Which of the following elemetns woul yield: (i) an acidic oxide, (ii) a basic oxide, and (iii) a neutral oxide

Na, S, C, K, H

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39. (a). What are amphoteric oxides ? Give two examples of amphoteric oxides.

(b). Choose the acidic oxides, basic oxides and neutral oxides from the following :

$Na_2O, CO_2, CO, SO_2, MgO, N_2O, H_2O$

(c). Which of the following are amphoteric oxides :

$MgO, ZnO, P_2O_3, Al_2O_3, NO_2$

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40. (a). What is the neture of the oxide SO_2? What happens when it is dissolve din water? Write the chemical equation fot he reaction involved.

(b). What is the nature of the oxide Na_2O? What happens when it is dissolved in water? Write the chemical equation of the reaction involved.

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41. (a). What is the nature of the oxide SO_2? What happens when it is dissolve din water? Write the chemical equation for the reaction involved.

(b). What is the nature of the oxide Na_2O? What happens when it is dissolved in water? Write the chemical equation of the reaction involved.

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42. (a). How do metals usually do not liberate hydrogen gas with dilute nitric acid.

(b). Name two metals which can, however, liberate hydrogen gas from very dilute nitric acid.

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43. (a). How do non-metals react with hydrogen? Explain with an example.

(b). How do non-metals react with hydrogen ? Explain with an example.

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44. (a). What happens when calcium reacts with chlorine? Write an equation for the reaction which takes place.

(b). What happens when magnesium reacts with very dilute nitric acid? Write an equation for the reaction involved.

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45. (a). Arrange the following metals in order of their chemical reactivity, placing the most reactive metal first:

magnesium, copper, Iron, sodium, Zinc, Lead, Calcium.

(b). What happens when a rod fo zinc metal is dipped into a solution of copper sulphate? Give chemcial equation fo the reaction involved.


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46. A copper plate was dipped in $AgNO_3$ solutions. After certain time, silver from the solution was deposited on the copper plate. State the reason whhy it happened. Give the chemical equation fo the reaction involved.

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47. State five uses of metals and five of non-metals.

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48. State one use each of the following metals:

Copper, Aluminium, Iron, Silver, Gold, Mercury.

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49. (a). State one use each of the followign non-metals:

Hydrogen, Carbon (as Graphite), Nitrogen, Sulphur

(b). Name the metal which is used in making thermomenters.

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50. (a). Why does aluminium not react with water under ordinary conditions?

(b). Name two metals which can displace hydrogen from dilute acids.

(c). Name two metals which cannot displace hydrogen from dilute acids.

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51. (a). Why is sodium kept immersed in kerosene oil ?

(b). Why is white phosphorus kept immersed under water ?

(c). Can we keep sodium immersed under water ? Why ?

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52. (a). Describe the reaction of potassium with water. Write the equation of the reaction

involved.

(b). Write an equation of the reaction of iron with steam. Indicate the physical states of all the reactants and products.

(c). Which gas is produced when dilute hydrochloric acid is added to a reactive metal?

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53. (a). Give one example, with equation, of the displacement of hydrogen by a metal from an acid.

(b). Name two metals (other than zinc and iron) which can displcae hydrogen from dilute hydrochloric acid?

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54. What is the action of water on (a) sodium (b) magnesium, and (c) aluminium? Write equations of the chemical reaction involved.

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55. You are given samples of three metals- sodium, magnesium and copper suggest any two activities to arrange them in order of their decreasing reactivities.

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56. (a). Write one reaction in which aluminimum oxide behaves as a basic oxide and another in which it behaves as an acidic oxide.

(b). What special name is given to substances like aluminium oxide.

(c). Name another metal oxide which behaves like aluminium oxide.

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57. (a). What happens when calcium reacts with water? Write the chemical equation of the reaction of calcium with water.

(b). Write the chemical equation of the reaction which takes place when iron reacts

with dilute sulphuric acid. What happens when the gas produced is ignited with a burning matchstick?

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58. You are given a dry cell, a torch bulb with holder, wires ad crocodile clips. How would you use them to distinguish between samples of metals ad non-metals?

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59. State any five physical properties of metals and five physical properties of non-metals.

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60. (a). Name two physical properties each of sodium and carbon in which their behaviour is not as expected from their classification as metal ad non-metal respectively.

(b) Name two metals whose melting points are so low that they melt when held in the hand.

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61. Metals are said to be shiny. Why do metals generally appear to be dull ? How can their brightness be restored ?

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62. (a). What are metals? Name five metals.

(b). Name a metal which is so soft that it can be cut with a knife.

(c). Name the metal which is the best

conductor of heat and electricity.

(d). What happens when a metal reacts with dilute hydrochloric acid ? Explain with the help of an example.

(e). Write the equations for the reactions of :

(i). Magnesium with dilute hydrochloric acid.

(ii). Aluminium with dilute hydrochloric acid.

(iii). Zinc with dilute hydrochloric acid

(iv). Iron with dilute hydrochloric acid.

Name the products formed in each case, also indicate the physical states of all the substances involved.

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63. (a). Define non-metals. Give five examples of non-metals.

(b). Name a non-metal which conducts electricity.

(c). Name a non-metal having lustre (shining surface).

(d). Name a non-metal which is extremely hard.

(e). How do non-metals react with oxygen ? Explain with an example. Give equation of the reaction involved.

What is the nature of the product formed ?

How will you demonstrate it ?

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64. (a). What is meant by the reactivity series of metals ? Arrange the following metals in an increasing order of their reactivities towards water:

Zinc, Iron, Magnesium, Sodium.

(b). Hydrogen is not a metal but still it has been assigned a place in the reactivity series

of metals. Why?

(c). Name one metal more reactive and another less reactive than hydrogen.

(d). Name one metal which displaces copper from copper sulphate solution and one which does not.

(e). Name one metal which displaces silver from silver nitrate solution and one which does not.

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65. The elements whose oxides can turn phenolphthalein solution pink are:

A. Na and K

B. K and C

C. Na and S

D. K and P

Answer: A

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66. "Is malleable and ductile " best describes:

A. a metal

B. A compound

C. A non-metal

D. a solution

Answer: A

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67. One of the following is not a neutral oxide.

This is :

A. CO

B. H_2O

C. N_2O

D. Na_2O

Answer: D

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68. A basic oxide will formed by the element :

A. K

B. S

C. P

D. Kr

Answer: A

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69. An acidic oxide iis produced by the element:

A. Na

B. C

C. Ca

D. H

Answer: B

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70. You are given a solution of $AgNO_3$ which of the following do you think cannot displace Ag from $AgNO_3$ solution ?

A. Magnesium

B. Zinc

C. Gold

D. Copper

Answer: C

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71. Out of aluminium, copper, calcium and tin, the most reactive metal is:

A. aluminium

B. copper

C. tin

D. calcium

Answer: D

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72. The least reactive metal among the following is :

A. sodium

B. silver

C. copper

D. lead

Answer: B

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73. An element X reacts with hydrogen, when heated, to form a covalent hydride H_2X. If H_2X has a small of rotten eggs, the element X is likely to be :

A. carbon

B. sulphur

C. chlorine

D. phosphorus

Answer: B

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74. Out of the following oxides, the amphoteric oxide is:

A. Fe_2O_3

B. Al_2O_3

C. P_2O_5

D. N_2O

Answer: B

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75. The metals which can produce amphoteric oxides are :

A. sodium and aluminium

B. zinc and potassium

C. calcium and sodium

D. aluminium and zinc

Answer: D

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76. An element X forms two oxides XO and XO_2. The oxide XO is neutral but XO_2 is acidic in nature. The element X is most likely to be :

A. sulphur

B. carbon

C. calcium

D. hydrogen

Answer: B

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77. The element whose oxides can turn litmus solution blue are :

A. carbon and sulphur

B. sodium and carbon

C. potassium and magnesium

D. magnesium and sulphur

Answer: C

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78. The elements whose oxides can turn litmus solution red are:

A. lithium and sodium

B. copper and potassium

C. carbon and hydrogen

D. phosphorus and sulphur

Answer: D

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79. Zinc oxide is a metal oxide. Which of the following term best describes the nature of zinc oxide:

A. an acidic oxide

B. a basic oxide

C. an amphoteric oxide

D. a neutral oxide.

Answer: C

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80. A metal less reactive and another metal more reactive than hydrogen are :

A. aluminium and lead

B. iron and magnesium

C. copper and tin

D. copper and mercury

Answer: C

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81. An element E reacts with water to form a solution which turns phenolphthalein solution pink. The element E is most likely to be :

A. S

B. Ca

C. C

D. Ag

Answer: B

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82. An element reacts with oxygen to give a compound with a high melting point. This compound is also soluble in water. The element is likely to be

A. calcium

B. carbon

C. silicon

D. iron

Answer: A

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83. Which one of the following four metals would be displaced from the solution of its salts by other three metals?

A. Zn

B. Ag

C. Cu

D. Mg

Answer: B

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84. An element is soft and can be cut with a knife. It is very reactive and cannot be kept open in the air. It reacts vigorously with water. The element is most likely to be :

A. Mg

B. S

C. P

D. Na

Answer: D

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85. Which of the followig metal exist in the liquid state?

A. Na

B. Ag

C. Cr

D. Hg

Answer: D

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86. Which of the following non-metal is a liquid?

A. carbon

B. sulphur

C. bromine

D. iodine

Answer: C

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87. Which of the following pair of reactants can undergo a displacement reaction under appropriate conditions?

A. $MgSO_4 + Fe$

B. $ZnSO_4 + Fe$

C. $MgSO_4 + Pb$

D. $CuSO_4 + Fe$

Answer: D

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88. An element E forms an oxide E_2O. An aqueous solution of E_2O turns red litmus paper blue.

(a). What is the nature of the oxide E_2O?

(b). State whether element E is a metal or a non-metal.

(c). Give one example of an element like E.

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89. Metal A burns in air, on heating, to form an oxide A_2O_3 whereas another metal B burns in air only on strong heating to form an oxide BO. The two oxides A_2O_3 and BO can react with hydrochloric acid as well as sodium hydroxide solution to form the corresponding salts and water.

(a). What is the nature of oxide A_2O_3?

(b). What is the nature of oxide BO?

(c). Name one metal like A.

(d). Name one metal like B.

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90. An element X forms two oxides XO and XO_2. The oxide XO has no action litmus solution but oxide XO_2 turns litmus solution red.

(a). What is the nature of oxide XO ?

(b). What is the nature of oxide XO_2 ?

(c). Would you call element X a metal or a non-metal ? Give reason for you choice.

(d). Can you give an example of element like X ?

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91. State and explain the reactions, if any, of the following metals with a solution of copper sulphate

(a). Gold

(b). Copper

(c). Zinc

(d). Mercury

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92. (a). Give the names and formulae of one metal chloride and one non-metal chloride.

(b). State an important property in which these metal chloride and non-metal chloride differ.

(c). Why do they differ in this property ?

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93. In a solution of lead acetate, a strip of metal M was dipped. After some time, lead from the solution was deposited on the metal

strip. Which metal is more reactive, M or lead

?

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94.

$CuSO_4(aq) + Fe(s) \rightarrow FeSO_4(aq) + Cu(s)$

$FeSO_4(aq) + Zn(s) \rightarrow ZnSO_4(aq) + Fe(s)$

On the basis of the above reactions, indicate which is most reactive ad which iis least reactive metal out of zinc, copper and iron.

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95. Which of the following reactions will not occur ? Why not ?

(a).

$$MgSO_4(aq) + Cu(s) \rightarrow CuSO_4(aq) + Mg(s)$$

(b).

$$CuSO_4(aq) + Fe(s) \rightarrow FeSO_4(aq) + Cu(s)$$

(c).

$$MgSO_4(aq) + Fe(s) \rightarrow FeSO_4(aq) + Mg(s)$$

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96. In nature, metal A is found in a free state while metal B is found in the form of its compounds. Which of these two will be nearer to the top of the activity series of metals ?

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97. If A,B,C,D,E,F,G,H,I,J and K represetnt metals in the decreasing order of their reactivity, which one of them is most likely to occur in a free state in nature?

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98. (a). Name a metal for each case :

(i). It does not react with cold as well as hot water but reacts with steam.

(ii). It does not react wth any physical state of water.

(b). When calcium metal is added to water, the gas evolved does not catch fire but the same gas evolved on adding sodium metal to water catches fire, why is it so?

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99. A zinc plate was kept in a glass container having $CuSO_4$ solution. On examining it was found that the blue colour of the solution is getting lighter. After a few days, when the zinc plate was taken out of the solution, a number of small holes were noticed in it. State the reason and give chemical equation of the reaction involved.

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100. What is the name of the chemical bond formed:

(a). By the sharing of electrons between two atoms?

(b). By the transfer of electrons from one atom to another?

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101. Name a carbon containing molecule which has two double bonds.

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102. What would be the electron dot structure of carbon dioxide which has the formula CO_2?

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103. What type of chemical bond is formed between:

(a). Potassium and bromine?

(b). Carbon and bromine?

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104. (a). What do we call those particles which have more or less electrons than the normal atoms?

(b). What do we call those particles which have more electrons than the normal atoms?

(c). What do we call those particles which have less electrons than the normal atoms?

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105. (a). The atomic number of sodium is 11. What is the number of electrons in Na^+?

(b). The atomic number of chlrine is 17. What is the number of electrons in Cl^-?

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106. The atomic number of an element X is 8 and that of element Y is 12. Write down the symbols of the ions you would expect to be formed from their atoms.

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107. (a). Write down the electronic configuration of (i) magnesium atom, and (ii) magnesium ion,

(At No. of Mg=12) ,brgt (b). Write down the electronic configuration of (i) sulphur atom, and (ii) sulphide ion.

(At. No. of S=16).

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108. What type of chemical bonds are present in a solid compound which has a high melting point, does not conduct electricity in the solid state but becomes a good conductor in the molten state?.

A. Covalent bonds

B. Ionic Bonds

C. Hydrogen Bonds

D. Metallic Bonds

Answer: B

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109. State whether the followig statement is true or false:

The Aquous solution of an ionic compound conducts electricity because there are plenty of free electrons in the solution.

A. True

B. False

C. Data in sufficient

D. None of the above

Answer: B

110. What type of bonds are present in hydrogen chloride and oxygen?

111. Write the electron-dot structure for the following molecules:

(i) NaCl

(ii). Cl_2.

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112. The correct electron dot structure of a water molecule is

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113. What type of bonds are present in methane (CH_4) and sodium chloride $(NaCl)$?

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114. State one major difference between covalent and ionic bonds and give one example each of covalent and ionic compounds.

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115. What type of bonds are present in the following molecules? Draw their electron-dot structures.

(i) H_2

(ii). CH_4

(iii). Cl_2

(iv). O_2.

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116. Which inerrt gas electron configuration do the Cl atoms in Cl_2 molecule resemble ? What is this electron configuration?

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117. Which of the following compounds are ionic and which are covalent?

Urea, Canesugar, Hydrogen chloride, Sodium chloride Ammonium chloride, carbon

tetrachloride, Ammonia, alcohol, magnesium chloride.

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118. Give one example each of the following

(i) A molecule containing a single covalent bond

(ii). A molecule containing a double covalent bond

(iii). A molecule containing a triple covalent

bond.

(iv). A compound containing an ionic bond.

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119. Fill in the blanks in the following sentences :

(i). Two atoms of the same element combine to form a molecule. The bond between them is known as ___ bond

(ii). Two chlorine atoms combine to form a molecule. The bond between them is known as

_____

(iii). In forming oxygen molecule _____ electrons are shared by each atom of oxygen.

(iv). In forming N_2 molecule _____ electrons are shared by each atom of nitrogen.

(v). The number of single covalent bonds in C_2H_2 molecule are _____

(vi). Melting points and boiling points of ionic compounds are generally _____ than those of covalent compounds.

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120. (a). What is a covalent bond? What type of bond exists in (i) CCl_4 and (ii). $CaCl_2$?

(b). What is an ionic bond? What type of bond is present in oxygen molecule?

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121. (a). What is an ion? Explain with examples

(b). What iis the nature of charge on (i). A cation and (ii) and anion?

(c) Name the cation and anion present in $MgCl_2$ also write their symbols.

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122. State four major physical properties that can be used to distinguish between covalent and ionic compounds. Mention the distinguishing features in each case.

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123. Explain why:

(a). Covalent compounds have generally low melting points.

(b) ionic compounds have generally high melting points.

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124. (a). Give two general properties of ionic compounds and two those of covalent compounds.

(b). State one test by which sodium chloride can be distinguihsed from sugar.

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125. (a). Explain why, ionic compounds conduct electricity in solution whereas covalent compounds do not conduct electricity.

(b). Which of the following will conduct electricity and which not ?

$MgCl_2, CCl_4, NaCl, CS_2, Na_2S$

Give reason for your choice.

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126. (a) Name one ionic compound containing chlorine and one covalent compound

containing chlorine.

(b) How will ou find out which of the water soluble compond A or B is ionic.?

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127. Explain why, a solution of cane sugar does not conduct electricity but solution of common salt is a good conductor of electricity.

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128. Give the formulae of the stable binary compounds that would be formed by the combination of following pairs of elements.

(a) Mg and N_2 $(b) Li$ and O_2

(c) Al and Cl_2 $(d) K$ and O_2

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129. (a). What are noble gases ? What is the characteristic of the electronic configuration of noble gases ?

(b). What is the cause of chemical bonding (or chemical combination) of atoms of elements ?

Watch Video Solution

130. (i) Write electrondot structures for magnesium and oxygen. ltBrgt (ii) show the formation of MgO by the transfer of electrons. ltBrgt (iii) . What are the ions present in this compound?

Watch Video Solution

131. Draw the electron-dot structure of a hydrogen chloride molecule:

(i). Which inert gas does the H atom in HCl resemble in electron arrangement?

(ii) Which inert gas does the Cl atom in HCl resemble in electron arrangement?

Watch Video Solution

132. What type of bonding would you expect between the following pairs of elements?

(i). Calcium and Oxygen

(ii). Carbon and Chlorine

(iii). Hydrogen and Chlorine

Watch Video Solution

133. Describe how sodium and chlorine atoms are chagned into ions when they react with each other to from sodium chloride NaCl. What is theh name given to this type of bonding? (At. No of sodium=11,At. No. of chlorine=17).

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134. What is the difference between a cation and an anion? How are they formed?Give the naems and symbols of the cation and one anion.

 Watch Video Solution

135. Using electron-dot diagrams which show only the outermost shwll electrons, show how a molecule of nitrogen N_2, is formed from two nitrogen atoms. What name is given to this

type of bonding? (Atomic number of nitrogen is 7).

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136. Draw the electron-dot structures of the following compounds and state the type of bonding in each case:

(i) CO_2

(ii). MgO

(iii). H_2O

(iv) HCl

(v) $MgCl_2$.

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137. Using electron-dot diagrams which show only the outermost shell electrons, show how a molecule of oxygen, O_2, is formed from two oxygen atoms. What name is given to this type of bonding ? (At. No of oxygen $= 8$)

Watch Video Solution

138. Draw the electron-dot structures of the following compounds and state the type of bonding in each case:

(i). KCl

(ii) NH_3

(iii). CaO

(iv). N_2

(v). $CaCl_2$.

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139. Explain why, a salt which does not conduct electricity in the solid state becomes a good conductor in molten state.

Watch Video Solution

140. (a). Write down the electronic configuration of (i) Sodium atom, and (ii) Chlorine atom.

(b). How many electrons are there in the outermost shell of (i) a sodium atom, and (ii) a

chlorine atom?

(c). Show the formation of $NaCl$ from sodium and chlorine atoms by the transfer of electron(s).

(d). Why has sodium chloride a high melting point ?

(e) Name the anode and the cathode used in the electrolytic refining of impure copper metal.

Watch Video Solution

141. (a). Write the electron arrangement in (i) a magnesium atom, and (ii) an oxygen atom.

(b). How many electrons are there in the valence shell of (i) a magnesium atom, and (ii) an oxygen atom ?

(c) Show on a diagram the transfer of electrons between the atoms in the formation of MgO.

(d) Name the solvent in which ionic compounds are generally soluble.

(e). Why are aqueous solutions of ionic compounds able to conduct electricity ?

Watch Video Solution

142. (a) What is the electronic configuration of (i) a sodium atom, and (ii) and oxygen atom ?

(b) What is the number of outermost electrons in (i) a sodium atom, and (ii) and oxygen atom?

(c) Show the formation of Na_2O by the transfer of electrons between the combining atoms.

(d) Why are ionic compounds usually hard ?

(e) How is it that ionic compounds in the solid

state do not conduct electricity but they do so when in molten state ?

Watch Video Solution

143. (a). Write down the electron arrangement in (i) a magnesium atom, and (ii) a chlorine atom.

(b). How many electrons are there in the valence shell of (i) a magnesium atom, and (ii) a chlorine atom ?

(c). Show the formation of magnesium

chloride from magnesium and chlorine by the transfer of electrons.

(d) State whether magnesium chloride will conduct electricity or not. Give reason for your answer.

(e). Why are covalent compounds generally poor conductors of electricity ?

Watch Video Solution

144. The atomic number of an element X is 19. The number of electrons in its ion X^+ will be

A. 18

B. 19

C. 20

D. 21

Answer: A

Watch Video Solution

145. The atomic number of an element Y is 17.

The number of electrons in its ion Y^- will be:

A. 17

B. 18

C. 19

D. 20

Answer: B

 Watch Video Solution

146. The atomic numbers of four elements, A, B, C and D are 6, 8, 10 and 12 respectively. The

two elements which can react to form ionic bonds (or ionic compounds) are:

A. A and D

B. B and C

C. A and C

D. B and D

Answer: D

Watch Video Solution

147. The atomic numbers of four elements P, Q, R and S are 6, 10, 12 and 17 respectively. Which two elements can combine to form a covalent compound ?

A. P and R

B. Q and S

C. P and S

D. R and S

Answer: C

Watch Video Solution

Watch Video Solution

148. The solution of one of the following compounds will not conduct electricity. This compound is :

A. $NaCl$

B. CCl_4

C. $MgCl_2$

D. $CaCl_2$

Answer: B

Watch Video Solution

149. The electronic configuration of three elements X, Y and Z are :

$X : 2$

$Y : 2, 8, 7$

$Z : 2, 8, 2$

Which of the following is correct regarding these elements ?

A. X is a metal

B. Y is a metal

C. Z is a non-metal

D. Y is a non-metal and Z is a metal

Answer: D

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150. Which one of the following properties is not generally exhibited by ionic compounds ?

A. solubility in water

B. electrical conductivity in solid state

C. high melting and boiling points

D. electrical conductivity in molten state

Answer: B

Watch Video Solution

151. The electrons present in the valence shell of a noble gas atom can be:

A. 8 only

B. 2 only

C. 8 or 2

D. 8 or 4

Answer: C

Watch Video Solution

152. The atomic number of an element X is 16. The symbol of ion formed by an atom of this element will be:

A. X^{2+}

B. X^{3+}

C. X^{2-}

D. X^{-}

Answer: C

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153. The number of protons in the nucleus of one atom of an element Y is 5. The symbol of ion formed by an atom of this element will be :

A. Y^{3-}

B. Y^{2+}

C. Y^{2-}

D. Y^{3+}

Answer: D

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154. Out of KCl, HCl, CCl_4 and $NaCl$, the compounds which are not ionic are:

A. KCl and HCl

B. HCl and CCl_4

C. CCl_4 and $NaCl$

D. KCl and CCl_4

Answer: B

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155. Element X reacts with element Y to form a compound Z, during the formation of compound Z, atoms of X lose one electron

each whereas atoms of Y gain one electron each. Which of the following property is not shown by compound Z ?

A. high melting point

B. low melting point

C. occurrence as solid

D. conduction of electricity in molten state

Answer: B

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156. One of the following compounds is not ionic in nature. This compound is:

A. Lithium chloride

B. Ammonium chloride

C. Calcium chloride

D. Carbon tetrachloride.

Answer: D

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157. The rechargeable battery used in a mobile phone hand set is usually :

A. lead ion battery

B. sodium ion battery

C. hydrogen ion battery

D. lithium ion battery

Answer: D

 Watch Video Solution

158. The number of protons in one atom of an element X is 8. What will be the number of electrons in its ion X^{2-}?

A. 8

B. 9

C. 10

D. 11

Answer: C

Watch Video Solution

159. If the number of protons in one atom of an element Y is 20, then the number of electrons in its ion Y^{2+} will be :

A. 20

B. 19

C. 18

D. 16

Answer: C

Watch Video Solution

160. The noble gas having only two electrons in its valence shell is:

A. Ar

B. Ne

C. He

D. Kr

Answer: C

 Watch Video Solution

161. A covalent molecule having a double bond between its atoms is:

A. Hydrogen

B. Oxygen

C. Water

D. Ammonia

Answer: B

Watch Video Solution

162. The molecules having triple bond in them are:

A. oxygen and ethyne

B. carbon dioxide and ammonia

C. methane and ehthene

D. nitrogen and ethyne

Answer: D

Watch Video Solution

163. One of the following contains a double bond as well as single bonds. This is:

A. CO_2

B. O_2

C. C_2H_4

D. C_2H_2

Answer: C

Watch Video Solution

164. Which of the following has a triple bond as well as single bonds?

A. ethene

B. methane

C. ethyne

D. nitrogen

Answer: C

Watch Video Solution

165. Two non-metals combine with each other by the sharing of electrons to form a compound X.

(a). What type of chemical bond is present in X?

(b). State whether X will have a high melting point or low melting point.

(c). Will it be a good conductor of electricity or not?

(d). Will it dissolve in an organic solvent or not?

166. A metal combines with a non-metal by the transfer of electrons to form a compound Y.

(i) state the type of bonds in Y.

(ii). What can you say about its melting point and boiling point?

(iii) Will it be a good conductor of electricity?

(iv). Will it dissolve in an organic solvent or not?

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167. The electronic configuration of three elements X, Y and Z are as follows

$X - 2, 4$

$Y - 2, 7$

$Z - 2, 1$

(a) Which two elements will combine to form an ionic compound?

(b). Which two elements will react to form a covalent compound ?

Give reason for your choice.

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168. An element A has 4 valence electrons in its atom whereas element B has only one valence electron in its atom. The compound formed by A and B does not conduct electricity. What is the nature of chemical bond in the compound formed ? Give its electron-dot structure.

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169. In the formation of a compound XY_2 atom X gives one electron to each Y atom. What is the natrue of bond in XY_2? Give two properties of XY_2.

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170. An element 'A' has two electrons in the outermost shell of its atom and combines with an element 'B' having seven electrons in the outermost shell, forming the compound AB_2.

The compound when dissolved in water conducts electric current. Giving reasons, state the natrue of chemical bond in the compound.

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171. The electronic configurations of two elements A and B are given below:

A 2,6

B 2,8,1

(a). What type of chemical bond is formed between the two atoms of A?

(b). What type of chemcial bond will be formed between the atoms of A and B?

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172. Four elements A, B, C and D have the following electron arrangement in their atoms :

A- 2, 8, 6

B - 2, 8, 8

C - 2, 8, 8, 1

D - 2, 7

(a). What type of bond is formed when element C combines with element D ?

(b). Which element is an inert gas ?

(c). What will be the formula of the compound between A and C ?

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173. An element X oif atomic number 12 combines with an element Y of atomic number 17 to form a compound XY_2. State the nature of chemical bond in XY_2 and show how the

electron configurations of X and Y change in the formation of this compound.

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174. The electronic configurations of three elements A, B, and C are as follows:

A 2,8,1

B 2,8,7

C 2,4

(a). Which of these elements is a metal?

(b). Which of theseelements are non-metals?

(c). Which two elements will combine to form an ionic bond?

(d). Which two elements will combine to form a covalent bond?

(e). Which element will form an anion of valency 1?

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175. the electronic configurations of four particles A,B,C and D are given below:

A 2,8,8

B 2,8,2

C 2,6

D 2,8

Which electronic configurations represents:

(i) magnesium atom?

(ii) oxygen atom?

(iii) sodium ion?

(iv). chloride ion?

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176. The atomic number of an element X is 12.

(a). What must an atom of X do to attain the nearest inert gas electron configurations?

(b) Which inert gas is nearest to X?

Watch Video Solution

177. The atomic number of an element Y is 16.

(a). What must an atom of Y do to achieve the nearest inert gas electron arrangement?

(b). Which inert gas is nearest to Y?

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178. You can buy solid air-freshnersin shops. Do you think these substanecs are ionic or covalent? Why?

Watch Video Solution

179. Give the formulae of the chlorides of the elements X and Y having atomic numbers of 3 and 6 respectively.

Will the properties of the two chlorides be similar or different ? Explain your answer.

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180. A zinc ore gave CO_2 on treatment with a dilute acid. Identify the ore and write its chemical formula.

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181. What chemical process is used for obtaining a metal from its oxide?

Watch Video Solution

182. State two ways to prevent the rusting of iron.

Watch Video Solution

183. What is meant by galvanisation? Why is it done?

Watch Video Solution

184. Name the metal which is used for galvanising iron.

Watch Video Solution

185. Explain why,iron sheets are coatedwith zinc.

Watch Video Solution

186. Why do we apply paint on iron articles?

Watch Video Solution

187. Give reason for the following:

Carbonate and sulphide ores are usually

converted into oxides during the process of extraction of metals.

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188. Name a reducing agent that may be used to obtain manganese from manganese dioxide.

Watch Video Solution

189. Name an alloy of lead and tin.

Watch Video Solution

190. Give the composition of an alloy called solder. State its one property and one use.

Watch Video Solution

191. what is an amalgam?

Watch Video Solution

192. How many carats is pure gold ? Why is pure gold not suitable for making ornaments ?

Watch Video Solution

193. Name one method for the refining of metals.

Watch Video Solution

194. State two conditions for the rusting of iron.

Watch Video Solution

195. In one method of rust prevention, the iron is not coated with anything.which is this method?

Watch Video Solution

196. Name two allys ofiron.what elements are present in these alloys?

Watch Video Solution

197. Give reason for the following:

Silver, gold and platinum are used to make jewellery.

Watch Video Solution

198. Which metal becomes black in the presence of hydrogen sulphide gas in air?

Watch Video Solution

199. name the gas in air which tarnishes silver articles slowly.

Watch Video Solution

200. Silver metal does not combine easily with oxygen but silver jewellery tarnishes after some time. How?

Watch Video Solution

201. Write the composition of the alloy called bronze. Give two uses of bronze.

Watch Video Solution

202. Why does a new aluminium vessel lose shine so soon after use?

Watch Video Solution

203. Why do gold ornaments look new even after several years of use?

Watch Video Solution

204. Name two metals which are highly resistant to corrosion.

Watch Video Solution

205. Which property of 'solder' alloy makes It suitable for welding electrical wires?

Watch Video Solution

206. Explain why, arbon cannot reduce oxides of sodium or magnesium.

Watch Video Solution

207. Why are the metals like Na,K,Ca and Mg never found in their free state in nature?

Watch Video Solution

208. Name one metal each which is extracted by:

(a). Reduction with carbon.

(b). Electrolytic reduction

(c). Reduction with aluminium

(d) reduction with heat alone.

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209. Fill in the following blanks with suitable words: ltbr. (a). The corrosion of iron is called.

(b) _____ and ____ are necessary for the rusting of iron.

(c). The process of depositing a thin layer of zinc on iron articles in called.

(d). Tiffin boxes are electroplated with ____but car bumbers are electroplated with _____to protect them fro rusting

(e) The corrosion of copper produces a_____coating of basic copper carbonate on its surface.

(f). Brass in an alloy of copper and ____

(g) Bronze is an alloy of copper and_____

(h) The non-metal present in steel is_____

(i) The alloy in which one of themtals is mecury is called an _____

(j) the electrical conductivity and melting point of an alloy is____than that of pure metals.

(i) The rocky material found with ores is called._____

Watch Video Solution

210. How is manganese extracted from manganese dioxide, MnO_2?Explain with the

help of an equation.

Watch Video Solution

211. What is a thermite reaction? Explain with the help of an equation.stateone use of this reaction.

Watch Video Solution

212. Which one of the methods given in column I is applied for the extraction fo each

of the metals given in column II:

Column I	*Column II*
Electrolytic reduction	Aluminium
Reduction with Carbon	Zinc
Reduction with Aluminium	Sodium
	Iron
	Manganese
	Tin

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213. (a) Give reasonwhy copper is used to make hot water tanksbut steel (an alloy of iron) is not.

(b). Explain why, the surface of some metals

acquires a dull appearance when exposed to air for a long time.

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214. (a) Why does aluminium not corrode right through ?

(b) What is meant by 'anodising' ? Why is it done ?

Watch Video Solution

215. (a) Why is an iron grill painted frequently?

(b). Explain why, through aluminium is more reactive than iron, yet there is less corrosion of aluminium when both are exposed to air.

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216. (a) Name the method by which aluminium metal is extracted.

(b) Give the name and chemical formula of one ore of copper.

(c). How is zinc extracted from its carbonate ore (calamine) ? Explain with equations.

 Watch Video Solution

217. (a). Name two metals which occur in nature in free state as well as in combined state.

(b). Name one ore of manganese. Which compound of manganese is present in this ore? Also write, its chemical formula.

(c) A zinc ore on heating in air forms sulphur

dioxide. Describe briefly any two stages involved int eh conversion of this concentrated ore into zinc metal.

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218. How doet the method used for extracting a metal from its ore depend on the metal's position in the reactivity series? Wxplain with examples.

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219. Explain by giving one example, how highly reactive metals (which are high up in the reactivity series) are extracted.

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220. Describe with one example, how moderately reactive metals (which are in the middle of reactivity series) are extracted.

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221. (a) Define the terms (i) mineral (ii) ore and (iii) gangue.

(b) What is meant by the concentration of ore?

(c) Name one ore of copper (other than cuprite).White compound of copper is present in this ore? Also, write its chemical formula.

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222. Explain how, a reduction reaction fo aluminium can be used for welding cracked

machine parts of iron.

Write a chemical equation for the reaction involved.

Watch Video Solution

223. (a) What is corrosion?

(b) Name any two metals which do not corrode easily.

(c) What is the corrosion of iron known as?

(d) Explain why aluminium is a highly reactive

metal, still it is used to make utensils for cooking.

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224. What is meant by 'rusting' ? With labelled diagrams, describe an activity to find out the conditions under which iron rusts.

Watch Video Solution

225. (a). What is an alloy? How is an alloy made?

(b) What elements are preent in steel? How are the properties of steel different from those of pure iron?

(c) give the constituents ad one use of brass.

 Watch Video Solution

226. (a) Name two metals which resist corrosion due to the formation of a thin, hard

ad imperrvious layer of oxide on their surface.

(b) Name five methods of preventing rusting of iron.

(c) What are the constituents of stainless steel? What are the special properties of stainless steel.?

Watch Video Solution

227. (a) name an alloy of copper. State its chemical composition and ay one use.

(b) Explain why, when a copper object remains

in damp air for a considerable time, a green coating is formed on its surface. What is this process known as?

Watch Video Solution

228. (a) How does the painting of an iron object prevent its rusting?

(b) How does the electrical conductivity of copper alloys, brass ad bronze, differ from that of pure copperr?

(c) What is meant by 22 carat gold? Name the

metals which are usually alloyed with gold to make it harder.

Watch Video Solution

229. What happens when

(a) $ZnCO_3$ is heated in the absence of oxygen ?

(b) a mixture of Cu_2O and Cu_2S is heated ?

Watch Video Solution

230. (a) For the reduction of a metal oxide, suggest a reducing agent other than carbon.

(b) Explain why, an aqueous solution of sodium chloride is not used for the electrolytic extraction of sodium metal.

Watch Video Solution

231. (a) Name the chemical compound which is electrolysed in molten state to obtain aluminium metal. Which gas is evolved during

this process?

(b). Name the chemical compound which is electrolysed in molten state to obtain sodium metal. Which gas is produced in this process?

(c) name the gas produced when calamine ore is calcined

(d) Name the gas evolved when cinnabar ore is roasted.

 Watch Video Solution

232. (a). Name two metals which are found in nature mainly in the free state (as metallic elements)

(b) name two metals which are always found in combined state.

(c) What iron compound is present in haematite ore? Also write its chemical formula.

Watch Video Solution

233. (a) What is the difference betwee a mineral and an ore?

(b) Which metal is extracted from cinnabar ore?

(c) Name one ore of sodium. Name the sodium compound present in this ore and write its chemical formula.

(d) How is sodium metal extracted? Explain with the help of equation of the reaction involved.

(e) Name three other metals which are extracted in a manner similar to sodium.

Watch Video Solution

234. (a) Name the metal which is extracted from haematite ore.

(b) Name one ore of aluminium. Name the aluminium compound present in this ore and write its chemical formula.

(c) How is aluminium metal extracted ? Explain with the help of an equation.

(d) Name the electrode at which aluminium metal is produced.

(e) Which gas is produced during the

extraction of aluminium ? At which electrode is this gas produced ?

 Watch Video Solution

235. (a) Which metal is extracted from bauxite ore ?

(b) Give the name of one ore of iron. Which iron compound is present in this ore ? Write its chemical formula.

(c). Describe the extraction of zinc metal from its sulphide ore (zinc blende). Write equations

of the reactions involved.

(d) Explain why, the galvanised iron article is protected against rusting even if the zinc layer is broken.

(e) Name a common metal which is highly resistant to corrosion.

Watch Video Solution

236. (a) Name the metal which is extracted from the ore called 'rock salt'

(b) Name two ores of zinc. Write the names of

the chemical compounds present in them and give their chemical formulae.

(c) Explain how, mercury is extracted from its sulphide ore (cinnabar). Give equations of the reactions involved.

(d) In the electrolytic refining of a metal M, what would you take as anode, cathode and electrolyte?

(e). Name any five metals which are purified by electrolytic refining method.

Watch Video Solution

237. (a) Which metal is extracted from calamine ore ?

(b) Name one ore of mercury. Which mercury compound is present in this ore ? Write its chemical formula.

(c) How is copper extracted from its sulphide ore (copper glance), Cu_2S ? Explain with equations of the reactions involved.

(d). What is an alloy ? Give two examples of alloys.

(e) How are the properties of an alloy different from those of the constituent elements ?

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238. An ore of manganese metal is:

A. bauxite

B. haematite

C. cuprite

D. pyrolusite

Answer: D

Watch Video Solution

239. Which of the following is not an ore of Iron ?

A. cinnabar

B. calamine

C. haematite

D. rock salt

Answer: C

 Watch Video Solution

240. The metal which can be extracted from the bauxite ore is:

A. Na

B. Mn

C. Al

D. Hg

Answer: C

Watch Video Solution

241. The two metals which can be extracted just by heating their sulphides in air are:

A. sodium and copper

B. copper and aluminium

C. potassium and zinc

D. mercury and copper

Answer: D

 Watch Video Solution

242. A common metal which is highly resistant to corrosion is :

A. iron

B. copper

C. aluminium

D. magnesium

Answer: C

Watch Video Solution

243. An important ore of zinc metal is:

A. calamine

B. cuprite

C. pyrolusite

D. haematite

Answer: A

 Watch Video Solution

244. The chief ore of aluminium is

A. cinnabar

B. calamine

C. bauxite

D. pyrolusite

Answer: C

 Watch Video Solution

245. The two metals which are extracted by means of electrolytic reduction of their molten salts are :

A. magnesium and manganese

B. iron and aluminium

C. zinc and magnesium

D. magnesium and aluminium

Answer: D

Watch Video Solution

246. Stainless steel is very useful material for our life. In stainless steel, iron is mixed with

A. Cu and Cr

B. Cr and Ni

C. Cr and Sn

D. Cu and Ni

Answer: B

Watch Video Solution

247. If copper is kept open in air, it slowly loses its shining brown surface and gains a green coating. It is due to the formation of

A. hydrated copper sulphate

B. copper oxide

C. basic copper carbonate

D. copper nitrate

Answer: C

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248. Which among the following alloys contain mercury as one of its constituents?

A. Stainless steel

B. solder

C. duralumin

D. zinc amalgam

Answer: D

Watch Video Solution

249. Which of the following is an ore of mercury metal?

A. rock salt

B. cinnabar

C. calamine

D. haematite

Answer: B

 Watch Video Solution

250. Calamine ore can be used to extract one of the following metals. This metal is:

A. copper

B. mercury

C. aluminium

D. zinc

Answer: D

Watch Video Solution

251. Which of the followmg metals exist in their native state in nature?

A. Ag and Hg

B. Ag and Zn

C. Au and Hg

D. Au and Ag

Answer: D

Watch Video Solution

252. Which of the following reactants are used to carry out the thermite reaction requried for welding the broken railway tracks?

A. $Al_2O_3 + Fe$

B. $MnO_2 + Al$

C. $Fe_2O_3 + Al$

D. $Cu_2O + Fe$

Answer: C

Watch Video Solution

253. Which of the following alloys contains a non-metal as one of the constituents ?

A. brass

B. amalgam

C. steel

D. bronze

Answer: C

 Watch Video Solution

254. During the refining of a impure metal by electrolysis, the pure metal is a deposited:

A. at cathode

B. on the walls of electrolytic tank

C. at anode

D. at the bottom of electrolytic tank

Answer: A

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255. Which of the following metals can be obtained from haematite ore?

A. Copper

B. sodium

C. zinc

D. iron

Answer: D

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256. Brass is an alloy of:

A. Cu and Sn

B. Cu and Pb

C. Pb and Sn

D. Zn and Cu

Answer: D

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257. The metal which is always present in an amalgam is :

A. iron

B. aluminium

C. mercury

D. magnesium

Answer: C

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258. Manganese metal is extracted from manganese dioxide by a reduction process by making use of :

A. carbon

B. hydrogen

C. electrolysis

D. aluminium

Answer: D

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259. The metal which can be extracted simply by heating the cinnabar ore in air is :

A. Zn

B. Cu

C. Al

D. Hg

Answer: D

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260. Galvanisation is a method of protecting iron from rusting by coating it with a thin layer of

A. chromium

B. tin

C. zinc

D. copper

Answer: C

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261. Which of the following metals are extracted by the electrolysis of their molten chlorides ?

A. Na and Hg

B. Hg and Mg

C. Na and Mg

D. Cu and Fe

Answer: C

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262. Rock salt is an ore of one of the following metals. This metal is :

A. Mn

B. Na

C. Fe

D. Cu

Answer: B

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263. Silver articles become black on prolonged exposure to air. This is due to the formation of

A. oxide

B. hydride

C. sulphide

D. carbonate

Answer: C

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264. A sulphide ore is converted into metal oxide by the process of:

A. carbonation

B. roasting

C. calcination

D. anodising

Answer: B

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265. The metal which can be extracted from pyrolusite ore is :

A. mercury

B. manganese

C. aluminium

D. magnesium

Answer: B

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266. Calamine ore can be converted into zinc oxide by the process of :

A. dehydration

B. roasting

C. calcination

D. sulphonation

Answer: C

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267. Zinc blende ore can be converted into zinc oxide by the process of :

A. roasting

B. hydrogenation

C. chlorination

D. calcination

Answer: A

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268. An element A which is a part of common salt and kept under kerosene reacts with another element B of atomic number 17 to give a produce C. When an aqueous solution of product C is electrolysed then a compound D is formed and two gases are liberated.

(a) What are A and B?

(b) Identify C and D.

(c) What will be the action of C on litmus solution? Why?

(d) State whether element B is a solid. liquid or gas room temperature.

(e) Write formula of the compound formed when element B reacts with an element E having atomic number 5.

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269. A metal which exists as a liquid at room temperature is obtained by heating its sulphide ore in the presence or air.

(a) Name the metal and write its chemical symbol.

(b). Write the name and formula of the

sulphide ore.

(c) Give the equations of chemical reactions involved in the production of metal from its sulphide ore.

(d) Name a common device in which this metal is used.

(e) Can this metal displace copper from copper sulphate solution ? Why ?

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270. No chemical reaction takes place when granules of a rusty brown solid A are mixed with the powder of another solid B. However, when the mixture is heated, a reaction takes place between its components. One of the products C is a metal and settles down in the molten state while the other product D floats over it. It was observed that the reaction is highly exothermic.

(a) What could the solids A and B be ?

(b) What are the products C and D most likely to be ?

(c) Write the chemical equation for the reaction between A and B leading to the formation of C and D.

Mention the physical states of all the reactants and products in this equation and indicate the heat change which takes place.

(d) What is the special name of such a reaction ? State one use of such a reaction.

(e) Name any two types of chemical reaction under which the above reaction can be classified.

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271. In an electrolytic tank, aluminium metal is being extracted by the electrolysis of molten aluminium oxide using carbon electrodes. It is observed that one of the carbon electrodes is gradually burnt aay and has to be replaced.

(a) Which carbon electrode (cathode or anode) is burnt away?

(b) why is this carbon electrode burnt away?

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272. A metal X which is resistant to corrosion is produced by the electrolysis of its molten oxide whereas another metal Y which is also resistant to corrosion is produced by the reduction of its oxide with carbon. Metal X can be used in powder form in thermite welding whereas metal Y is used in making cathodes of ordinary dry cells.

(a). Name the metals X and Y.

(b) Which of the two metals is more reactive : X or Y ?

(c) Name one ore or metal X. Also write its

chemical formula.

(d) Name one ore of metal Y. also write its chemical formula.

(e) Name one alloy of metal X and one alloy of metal Y.

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273. When an object made of metal A is kept in air for a considerable time, it loses its shine and becomes almost black due to the formation fo a layer of substance B. when an

object made of another metal C is kept in damp air for a considerable time, it gets covered with a green layer of substance D. Metal A is the best conductor of electricity whereas metal C is the next best conductor of electricity.

(a) What is metal A?

(b) What is metal C?

(c) name the substance B.

(d) name the substance D.

(e) What type of chemcial can be used to remove the green layer from metal C and clean it? Why?

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274. Four metals P, Q, R and S are all obtained by the reduction of their oxides with carbon. Metal P is used to form a thin layer over the sheets of metal S to prevent its corrosion. Metal Q is used for electroplating tiffin boxes made of metal S whereas metal R is used in making car batteries. Metals Q and R form an alloy called solder. what are metals P, Q, R and S ? How have you arrived at this conclusion ?

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275. A black metal oxide XO_2 is used as catalyst in the preparation of oxygen gas from potassium chlorate. The oxide XO_2 is also used in ordinary dry cells. The metal oxide XO_2 cannot be reduced satisfactorily with carbon to form metal X.

(a) Name the metal X.

(b) Name the metal oxide XO_2

(c) Which reducing agent can be used to reduce XO_2 to obtain metal X ?

(d) Name another metal which can also be extracted by the reduction of its oxide with the above reducing agent.

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276. Metals X and Y can be recovered from the anode mud left behind after the electrolytic refining of copper metal. The coins made of metal X look new even after several years of use but the coins made of metal Y lose their shine gradually and get blackened soon. when

metal X is alloyed with a small amount of metal Y, it becomes hard and hence suitable for making ornaments. what are metals X and Y? Also state the colour of metal X.

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277. Give an example of a metal which

(i) is a liquid at room temperature.

(ii) can be easily cut with a knife.

(iii) is the best conductor of heat.

(iv) is a poor conductor of heat

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278. Explain the meanings of malleable and ductile.

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279. Why is sodium kept immersed in kerosene oil?

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280. Write equations for the reactions of

(i) iron with steam

(ii) calcium and potassium with water

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281. Samples of four metals A, B, C and D were taken and added to the following solution one by one. The results obtained have been tabulated as follows.

Metal	Iron(II) sulphate	Copper(II) sulphate	Zinc sulphate	Silver nitrate
A	No reaction	Displacement		
B	Displacement		No reaction	
C	No reaction	No reaction	No reaction	Displacement
D	No reaction	No reaction	No reaction	No reaction

Use the Table above to answer the following questions about metals A, B, C and D.

(i) Which is the most reactive metal?

(ii) What would you observe if B is added to a solution of Copper (II) sulphate?

(iii) Arrange the metals A, B, C and D in the order of decreasing reactivity.

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282. Which gas is produced when dilute hydrochloric acid is added to a reactive metal?

Write the chemical reaction when iron reacts with dilute H_2SO_4.

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283. What would you observe when zinc is added to a solution of iron (II) sulphate?

Write the chemical reaction that takes place.

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284. (i) Write the electron-dot structures for sodium, oxygen and magnesium.

(ii) Show the formation of Na_2O and MgO by the transfer of electrons.

(iii) What are the ions present in these compounds ?

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285. Why do ionic compounds have high melting points?

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286. Define the following terms.

(i) Mineral

(ii) Ore

(iii) Gangue

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287. Name two metals which are found in nature in the free state.

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288. What chemical process is used for obtaining a metal from its oxide?

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289. Metallic oxides of zinc, magnesium and copper were heated with the following metals.

Metal	Zinc	Magnesium	Copper
Zinc oxide Magnesium oxide Copper oxide			

In which cases will you find displacement reactions taking place?

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290. Which metals do not corrode easily?

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291. What are alloys?

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292. Which of the following pairs will give displacement reactions?

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293. Which of the following methods is suitable for preventing an iron frying pan from rusting?

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294. An element reacts with oxygen to give a compound with a high melting point. This compound is also soluble in water. The element is likely to be

A. Calcium

B. Carbon

C. Silicon

D. Iron

Answer: A

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295. Food cans are coated with tin and not with zinc because

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296. You are given a hammer, a battery, a bulb, wires and a switch.

(a) How could you use them to distinguish between samples of metals and non-metals ?

(b) Assess the usefulness of these tests in

distinguishing between metals and non – metals.

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297. What are amphoteric oxides? Give two examples of amphoteric oxides.

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298. Name two metals which will displace hydrogen from dilute acids, and two metals

which will not.

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299. In the electrolytic refining of a metal M, what would you take as the anode, the cathode and the electrolyte?

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300. Pratyush took sulphur powder on a spatula and heated it. He collected the gas

evolved by inverting a test tube over it, as shown in figure below.

(a) What will be the action of gas on

(i) dry litmus paper?

(ii) moist litmus paper?

(b) Write a balanced chemical equation for the reaction taking place.

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301. State two ways to prevent the rusting of iron.

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302. What type of oxides is formed when non-metals combine with oxygen?

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303. Give reasons

(a) Platinum, gold and silver are used to make jewellery.

(b) Sodium, potassium and lithium are stored under oil.

(c) Aluminium is a highly reactive metal, yet it is used to make utensils for cooking.

(d) Carbonate and sulphide ores are usually converted into oxides during the process of extraction.

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304. You must have seen tarnished copper vessels being cleaned with lemon or tamarind juice. Explain why these sour substances are effective in cleaning the vessels.

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305. Differentiate between metal and non-metal on the basis of their chemical properties.

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Long Answer Type Question

1. (a). State any three differences between the physical properties of metals and non-metals.

(b). Differentiate between metals and non-metals on the basis of their chemical properties.

(c). State three reasons (of which at least one must be chemical) for believing that sodium is a metal.

(d). State three reasons (of which at least one

must be chemical) for believing that sulphur is a non-metal.

(e). Which non-metal has been placed in the reactivity series of metals.

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Short Answer Type Qustions

1. How are the less reactive metals (which are quite low in the reactivity series) extracted? Explain with the help of an example.

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