

**Chemistry Vacation Worksheet****Class:Ten****Chapter-5: Chemical Bond [revision-repeated chapter from class-9 content]**

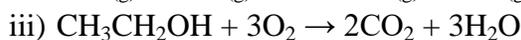
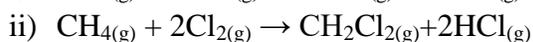
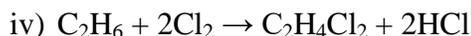
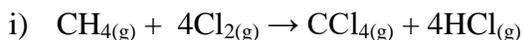
1. What are valence electron and valency?
2. What is radical? Mention its types with examples.
3. What are octate and duet rules?
4. What are cation and anion ?
5. What is chemical bond?
6. What are ionic bond and covalent bond?
7. What are lone pair and bond pair electron?
8. What are molecular formula and structural formula?
9. Discuss the stability of inert gases with electronic configurations of first four elements of the group.
10. Discuss the bond formations of NaCl, MgO, NaF, CaCl<sub>2</sub> and NaH with diagram.
11. Discuss the bond formations of NH<sub>3</sub>, CH<sub>4</sub>, H<sub>2</sub>O, O<sub>2</sub> and F<sub>2</sub> with diagram.
12. Non-metals (such as Cl, O and F) can form both covalent bond and ionic bond- Explain.
13. Explain the melting point and boiling point of ionic compounds (NaCl, AlCl<sub>3</sub>, CaCl<sub>2</sub> etc.) are higher than that of covalent compounds.
14. Ionic compounds conduct electricity in molten and solution state but covalent compounds do not. Explain.
15. What is polar compound?
16. Why is H<sub>2</sub>O/ ethanol(CH<sub>3</sub>CH<sub>2</sub>OH)/ methanol(CH<sub>3</sub>OH) polar compound?
17. Ionic compounds (NaCl, CaCl<sub>2</sub>) are soluble in polar compound (H<sub>2</sub>O, alcohol etc.)-Explain.
18. Which one is soluble in water between CH<sub>4</sub> and MgO? Explain.
19. Calculate the number of bond pair and lone pair electrons in molecule of NH<sub>3</sub>, CH<sub>4</sub>, H<sub>2</sub>O and O<sub>2</sub> showing the shape of molecule.
20. What is metallic bond?
21. Discuss the formation of bonding in sodium, aluminium and calcium.
22. Why is melting point of aluminium higher than sodium?
23. Why is aluminium used for making cooking utensils and overhead cables?
24. Discuss the heat conductivity and electric conductivity of metals (Na, Cu, Fe and Al).

**Chapter-8: Chemistry and Energy**

1. Define bond energy, chemical energy, exothermic and endothermic reaction.
2. Calculate the  $\Delta H$  value for the combustion of methane. [Here, bond energies of C-H, O=O, O-H and C=O are 414kJ/mol, 498kJ/mol, 464kJ/mol and 724kJ/mol respectively.

3. Explain why is energy changed in the combustion of methane./ combustion of ethanol.

4.



a) Calculate the value of  $\Delta H$  for the above reactions.

[Bond energy of C-H, Cl-Cl, C-Cl, H-Cl, O=O, O-H and C=O are 414kJ/mol, 244kJ/mol, 326kJ/mol, 431kJ/mol, 498kJ/mol, 464kJ/mol and 724kJ/mol respectively.]

b) Is there any lone pair electrons in the heavier product of above reaction (i)?- Analyze it with bond diagram.

5. What is electrolysis?

6. Discuss the importance of electrolysis.

7. Define Galvanic cell, electrochemical cell and electrolytic cell.

8. What are the differences between electrolytic cell and galvanic cell?

9. Why are few drops of sulphuric acid necessary in the electrolysis of pure water?/Why is acidic water called an electrolytic conductor?

10. Why is a salt bridge used in an electrochemical cell?

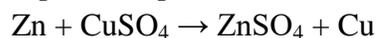
11. Why does  $\text{MnO}_2$  use in the dry cell?

12. Describe the formation of electrolytic cell.

13. What is meant by  $\text{Sn}/\text{Sn}^{2+}$ ?

14. Describe the formation of electrochemical cell (Galvanic cell).

15. Explain the process of electricity production using the reaction:



16. What is meant by strong electrolyte and weak electrolyte?

17. How can you produce caustic soda by electrolysis? Explain.

18. What is electroplating?

19. Explain the electrolysis mechanism of molten NaCl, saturated solution of NaCl and acidified water.

20. Why is ethanol mixing with petroleum used in developed country?

21. Differentiate between nuclear fission and nuclear fusion.

22. What is nuclear chain reaction?

23. Calculate the  $\Delta H$  value for the combustion of methane. [Here, bond energies of C-H, O=O, O-H and C=O are 414kJ/mol, 498kJ/mol, 464kJ/mol and 724kJ/mol respectively.]

### **Chapter-10: Mineral resources: metal-nonmetal**

1. What is minerals and ores?

2. Write down the names and formula of ores of Al, Fe, Cu, Zn, Pb, Hg, Ca, Na.[from textbook chart]

3. What is meant by metal reactivity series?

4. Between Bauxite and Galena ores, which ore goes through roasting?

5. What is meant by calcinations of ores/ roasting of ores?
6. Describe the condensation of bauxite ore by chemical method.
7. Describe the extraction process from ore of aluminium.
8. Why aluminium is not extracted from ores by carbon reduction process?
9. Describe the extraction process of iron in blast furnace.
10. Write down the reactions that occur during iron extraction in blast furnace.
11. Describe zinc extraction by carbon reduction.
12. Describe the purification of impure copper through electrolysis.
13. How and why does the extraction process of iron differ from that of aluminium from ores?
14. Why do we use other electrolytes with aluminium oxide in aluminium extraction process?
15. Why cryolite is used with  $\text{Al}_2\text{O}_3$  to aluminium extraction process?
16. What is alloy?
17. What is electroplating?
18. What is Galvanizing?
19. What is meant by recycling of metals?
20. Mention the composition of different alloys [from textbook chart]
21. What is slag?
22. What is smelting agent?
23. Describe Frasch method of sulfur extraction.
24. Describe the contact method to prepare sulphuric acid from sulphur.
25. Why sulphuric acid is needed to produce sulphuric acid in contact method?
26. Explain that  $\text{H}_2\text{SO}_4$  acts as an acid, oxidant and dehydrating agent.

### **Chapter-11: Minerals resources: Fossils**

1. What is fossil fuel?
2. What is gasohol?
3. What is gasoline?
4. What is aromatic compound/ aromatic hydrocarbon ?
5. What is functional group?
6. Define homologous series.
7. What is alkyl group?
8. Write down the general formula and functional group of alkane, alkene, alkyne, alcohol, aldehyde and fatty acid (carboxylic acid)
9. Why alkanes are called paraffin?
10. Why alkenes are known as olefins?
11. Why alkenes are more reactive than alkanes?
12. Explain which is less flammable between ethane and ethene.
13. Discuss three preparation methods of alkane.
14. Discuss the reaction of methane with chlorine?

15. Mention the combustion reaction of alkane(methane).
16. Discuss two preparation methods of alkene.
17. Discuss the reaction of hydrogen and water with alkene.
18. Discuss the two unsaturation tests of hydrocarbons.
19. Discuss the polymerization reactions of alkenes.
20. How is ethyne prepared from calcium carbide? Write with the reaction.
21. Explain with equations how to produce methanal (aldehyde) from methane(alkane).
22. How can you prepare polymer and glycol from ethene? Explain.
23. Discuss the preparation of alkene from ethanol/ ethanoic acid.
24. Differentiate between saturated and unsaturated hydrocarbons.
25. Define addition polymerization and condensation polymerization with example.
26. Write down the preparation of Nylon 6:6 with reaction.
27. Explain the preparation of methane from potato/ ethanol.
28. Potato can be used as alternate to fossil fuel-Explain.
29. Methanal is really important in different uses. But it is really harmful to our health. Evaluate.
30. Analyze the importance of compound ethanol and methanal in industry.

**MCQ worksheet**  
**Chapter-5(Chemical bond)**

1. What type of bond exist in  $\text{CaH}_2$ ?
  - a) Ionic
  - b) Covalent
  - c) Co-ordination
  - d) Metallic
2. If the electronegativity difference between two different elements is very high then the bond form between them is-
  - a) Covalent
  - b) Polar covalent
  - c) Metallic
  - d) ionic
3. If valence electron of an element is  $y$  then what will be the valency of that element?
  - a)  $y$
  - b)  $8-y$
  - c)  $y-8$
  - d)  $y$  or  $8-y$
4. Which compound has polarity?
  - a) HF
  - b)  $\text{CH}_4$
  - c)  $\text{CO}_2$
  - d)  $\text{PCl}_3$
5. Which elements valency is zero?
  - a) Na
  - b) Ni
  - c) Ne
  - d) Fe
6. Which of the two element gain the electronic configuration of argon to form ion?
  - a) Ca, Cl
  - b) Sc, Cl
  - c) K, O
  - d) S, C
7. Which one of the following has Vander- waals force?
  - a)  $\text{H}_2\text{S}$
  - b)  $\text{MgCl}_2$
  - c) NaCl
  - d) MgO
8. Which one of the following has triple bond?
  - a)  $\text{NH}_3$
  - b)  $\text{N}_2$
  - c)  $\text{BF}_3$
  - d)  $\text{I}_2$
9. Which compound is soluble in water?
  - a)  $\text{CCl}_4$
  - b)  $\text{SiCl}_4$
  - c)  $\text{C}_2\text{H}_5\text{OH}$
  - d)  $\text{SiO}_2$
10. Which one is an electronic conductor?
  - a) Graphite
  - b) Alkali solution
  - c) Acid solution
  - d) Salt solution
11. Which element shows variable valency?
  - a) O
  - b) P
  - c) Na
  - d) F
12. Which one is the formula of lead (II) oxide?
  - a) PbO
  - b)  $\text{PbO}_2$
  - c)  $\text{Pb}_2\text{O}$
  - d)  $\text{Pb}_3\text{O}_4$
13. In which anion and cation of compound of the following is equal no. of electron?
  - a) NaCl
  - b) CaS
  - c)  $\text{K}_2\text{O}$
  - d)  $\text{MgCl}_2$
14. During the formation of NaCl compound—
  - i) Na and Cl both attain electronic configuration of Ne
  - ii) Electrons are exchanged between Na and Cl
  - iii) Both Na and Cl follow octet ruleWhich one is correct?
  - a) i & ii
  - b) ii & iii

c) i & iii

d) i, ii & iii

15. Which one does not conduct electricity?

a) Aluminium

b) Silver

c) Graphite

d) Doamond

16. In which of the following compound each atom gain the electronic configuration of Neon?

a) CaO

b) Na<sub>2</sub>O

c) CaBr<sub>2</sub>

d) LiF

17. What is the latent valency of carbon in CO?

a) 2

b) 3

c) 4

d) 6

18. How many bond pair electrons are there in methane molecule?

a) 3

b) 4

c) 5

d) 6

19. How many lone pair electrons are present in H<sub>2</sub>S?

a) 1

b) 2

c) 3

d) 4

20. For which two elements valency will be same?

a) Ca, Zn

b) Al, Cu

c) Si, Na

d) N, Cl

21. In which compound the octet is incomplete?

a) CO<sub>2</sub>

b) BF<sub>3</sub>

c) CaCl<sub>2</sub>

d) CCl<sub>4</sub>

22. In the compound PCl<sub>5</sub>-

i) Bond pair electrons are 5

ii) Here the octet rules is failed

iii) The central atom is P

Which one is correct?

a) i & ii

b) ii & iii

c) i & iii

d) i, ii & iii

23. At the time of forming bond each molecule has gained the electron configuration of argon-

i) in KF

ii) in CaS

iii) in KCl

Which one is correct?

a) i & ii

b) ii & iii

c) i & iii

d) i, ii & iii

24. In water molecule is present—

i) delocalized electrons

ii) lone pair electrons

iii) covalent bond

Which one is correct?

a) i & ii

b) ii & iii

c) i & iii

d) i, ii & iii

25. Double bond have seen –

i) In oxygen molecule

ii) In butane molecule

iii) In dichloro methane

Which one is correct?

a) i

b) ii & iii

c) iii

d) i, ii & iii

26. In case of chlorine molecule—

i) It is a polar compound

ii) It remain in gaseous state at normal temperature

iii) Vander Waal's attraction remains effective

Which one is correct?

- a) i & ii  
b) ii & iii
- c) i & iii  
d) i, ii & iii
27. How many lone pair electrons are there in the compound that is formed by the combination of Boron and Fluorine elements?  
a) 0  
b) 3  
c) 6  
d) 9
28. Which elements show variable valency?  
a) P, Al  
b) P, Si  
c) P, S  
d) Al, Si
29. Which covalent bond creates polarity?  
a) HF  
b) CO<sub>2</sub>  
c) CH<sub>4</sub>  
d) NH<sub>3</sub>
30. O<sup>2-</sup> and Mg<sup>2+</sup> ions—  
i) Iso-electronic  
ii) Makes ionic bond  
iii) Compound is Mg<sub>2</sub>O  
Which one is correct?  
a) i & ii  
b) ii & iii  
c) i & iii  
d) i, ii & iii
31. Which compound has polarity?

### Chapter-08(Chemistry and Energy)

1. Which one is known as bio fuel?  
a) CH<sub>4</sub>  
b) CH<sub>3</sub>OH  
c) CH<sub>3</sub>CH<sub>2</sub>OH  
d) CH<sub>3</sub>COOH
2. Which compound fulfills the demand of electrolyte in our body?  
a) O<sub>2</sub>  
b) H<sub>2</sub>O  
c) CO<sub>2</sub>  
d) NaCl
3. N<sub>2(g)</sub> + 3H<sub>2(g)</sub> ⇌ 2NH<sub>3(g)</sub>. What is the value of ΔH in the above reaction?  
a) -198 kJ/mol  
b) -92 kJ/mol  
c) +92 kJ/mol  
d) +198 kJ/mol
4. In which molecule of the following is required more energy to break the molecule?  
a) H<sub>2</sub>  
b) O<sub>2</sub>  
c) Cl<sub>2</sub>  
d) HCl
5. N<sub>2(g)</sub> + O<sub>2(g)</sub> ⇌ 2NO<sub>(g)</sub>. It is understood from this reaction –  
i) It is an endothermic reaction  
ii) ΔH value of this reaction is positive  
iii) 180 kJ heat is absorbed during the reaction  
Which one is correct?  
a) i & ii  
b) ii & iii  
c) i & iii  
d) i, ii & iii
6. Which one is responsible for photochemical smog?  
a) SO<sub>2</sub>  
b) CO<sub>2</sub>  
c) NO<sub>2</sub>  
d) N<sub>2</sub>O
7. Which one is weak electrolyte?  
a) NaCl  
b) CH<sub>3</sub>COOH  
c) CuSO<sub>4</sub>  
d) H<sub>2</sub>SO<sub>4</sub>



- a)  $\text{MnO}_2$
- b)  $\text{MnCl}_2$

- c)  $\text{ZnCl}_2$
- d)  $\text{NH}_4\text{Cl} + \text{ZnCl}_2$

### Chapter-10(Mineral Resources: Metal-Nonmetal)

1. Which one is extracted by the carbon reduction process?
  - a) Ca
  - b) Zn
  - c) Na
  - d) Al
2. Which one of the following acids is the most widely used acid in industries?
  - a)  $\text{H}_2\text{CO}_3$
  - b)  $\text{HNO}_3$
  - c)  $\text{H}_2\text{SO}_4$
  - d)  $\text{H}_3\text{PO}_4$
3. What is the chemical formula of oleum?
  - a)  $\text{H}_2\text{SO}_4$
  - b)  $\text{H}_2(\text{SO})_4$
  - c)  $\text{H}_2\text{SO}_3$
  - d)  $\text{H}_2\text{S}_2\text{O}_7$
4. Which one is reduced first?
  - a)  $\text{Zn}^{2+}$
  - b)  $\text{Fe}^{2+}$
  - c)  $\text{Pb}^{2+}$
  - d)  $\text{Cu}^{2+}$
5. Galvanizing is done by coating-
  - a) Cu
  - b) Zn
  - c) Sn
  - d) Pb
6. Which one is purified by oil foam floatation system?
  - a)  $\text{Al}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$
  - b) PbS
  - c)  $\text{Fe}_3\text{O}_4$
  - d)  $\text{ZnCO}_3$
7. What is the composition of zinc metal in brass?
  - a) 35%
  - b) 65%
  - c) 75%
  - d) 80%
8. Which one is ore of lead?
  - a) Limonite
  - b) Magnetite
  - c) Hematite
  - d) Galena
9. Which ore is condensed by using oil foam floatation system?
  - a) Carbonate ores
  - b) Sulphite ores
  - c) Sulphate ores
  - d) Sulphide ores
10. In which copper slag is dissolved?
  - a) Water
  - b) Citric acid
  - c) Alcohol
  - d) Carbon tetrachloride
11. Which one is dehydrating agent?
  - a)  $\text{HNO}_3(\text{dil})$
  - b)  $\text{H}_2\text{SO}_4(\text{dil})$
  - c)  $\text{H}_2\text{SO}_4(\text{conc})$
  - d)  $\text{HCl}(\text{conc})$
12. Colour of copper slag is-
  - a) Brown
  - b) Green
  - c) Yellowish
  - d) Black
13. Which one is present more in duralumine?
  - a) Cu
  - b) Mg
  - c) Fe
  - d) Al
14. Which gas is released as by-product during extraction of copper?
  - a)  $\text{SO}_2$
  - b) CO
  - c)  $\text{CO}_2$
  - d)  $\text{SO}_3$
15. Which one is the correct order of reactivity?
  - a)  $\text{K} > \text{Na} > \text{Al}$
  - b)  $\text{Zn} > \text{Al} > \text{Ca}$

- c) Cu>Fe>Pb  
 16. Which one has to be extracted by electrolysis?  
 a) K  
 b) Cu  
 17. Which one is available in pure state?  
 a) Fe  
 b) Pb  
 18. Which of these is an ore condensation method?  
 a) Roasting method  
 b) Crush method  
 19. Which sample of gold is most hard?  
 a) 18 Karate  
 b) 22 karate  
 20. What is the melting point of NaCl?  
 a) 600°C  
 b) 1000°C  
 21. Which one is the melting point of the mixture of 40-42% NaCl and 58-60% CaCl<sub>2</sub>?  
 a) 600°C  
 b) 801°C  
 22. Which one is used as a flux in removing the impurities in iron extraction?  
 a) Al<sub>2</sub>O<sub>3</sub>  
 b) CaO  
 23. Calcination –  
 i) Can be done in presence of air  
 ii) Ore can be converted to metallic oxide  
 iii) Done in case of sulphide ores  
 Which one is correct?  
 e) i & ii  
 f) ii&iii  
 24. Ore with magnetic properties-  
 i) Chromite  
 ii) Wolframite  
 iii) Rutile  
 Which one is correct?  
 a) i & ii  
 b) ii&iii  
 25. MnO + SiO<sub>2</sub> → MnSiO<sub>3</sub>. In this reaction –  
 i) MnO is an alkaline mineral impurity  
 ii) SiO<sub>2</sub> is an acidic flux  
 iii) MnSiO<sub>3</sub> is a metallic impurity  
 Which one is correct?  
 a) i & ii  
 b) ii&iii  
 26. Bauxite ore contains as impurities-  
 i) Ore of iron  
 ii) Ore of sodium  
 iii) Ore of titanium  
 Which one is correct?  
 a) i & ii  
 b) ii&iii  
 27. Which one is used to make the body of aeroplane?  
 a) Stainless steel  
 b) Bronze  
 28. What is the process of coating of zinc or tin or iron by electrical method called?  
 a) Burnish  
 b) Galvanizing  
 c) Fe  
 d) Zn  
 c) Pt  
 d) Cu  
 c) Physical method  
 d) Froth floatation method  
 c) 21 karate  
 d) 24 karate  
 c) 801°C  
 d) 2050°C  
 c) 1000°C  
 d) 2050°C  
 c) SiO<sub>2</sub>  
 d) FeO  
 g) i&iii  
 h) i, ii &iii  
 c) i&iii  
 d) i, ii &iii  
 c) Brass  
 d) Duralumin

- c) Electroplating  
 29. Which is the composition of brass?  
 a) Cu 65%, Sn 35%  
 b) Cu 90%, Sn 10%
- d) Painting  
 c) Cu 65%, Zn 35%  
 d) Cu 90%, Zn 10%
30. Which one is anodic oxidation?  
 a) Electrolysis  
 b) Carbon reduction
- c) Metal corrosion  
 d) Cell reaction

### Chapter-11(Mineral Resources: Fossils)

- In which step does anesthetic produce in reaction of chlorine with methane in deem sunlight?  
 a) Step 1  
 b) Step 3  
 c) Step 2  
 d) Step 4
- Which type of chemical substance if generally perfumed like chemical?  
 a) Alcohol  
 b) Ester  
 c) Aldehyde  
 d) Organic acid
- What is the melting point of the isomer of ethanol?  
 a)  $-88.6^{\circ}\text{C}$   
 b)  $-42^{\circ}\text{C}$   
 c)  $-24^{\circ}\text{C}$   
 d)  $-1^{\circ}\text{C}$
- What is the percentage of diesel oil in petroleum?  
 a) 13%  
 b) 20%  
 c) 35%  
 d) 50%
- How many double bonds are present in the benzene molecule?  
 a) 1  
 b) 2  
 c) 3  
 d) 4
- Glycerol compound-  
 a) Aromatic  
 b) Alcohol  
 c) Aldehyde  
 d) Ketone
- How many amino acid are present in insulin polymer?  
 a) 20  
 b) 21  
 c) 22  
 d) 23
- Which solution is used to identify unsaturated hydrocarbon?  
 a) Sodium thaysulphate  
 b) Potassium dichromate  
 c) Mercuric sulphate  
 d) Potassium permanganate
- What is the functional group of the main component of formalin?  
 a)  $-\text{CHO}$   
 b)  $-\text{COOH}$   
 c)  $-\text{OH}$   
 d)  $=\text{CO}$
- What amount of methane is present in formalin according to volume?  
 a) 40%  
 b) 37%  
 c) 35%  
 d) 30%
- Which hydrocarbon is the 2<sup>nd</sup> member of alkene?  
 a)  $\text{C}_3\text{H}_8$   
 b)  $\text{C}_3\text{H}_6$   
 c)  $\text{C}_3\text{H}_4$   
 d)  $\text{C}_2\text{H}_6$
- What may happen if extra quantity of formaldehyde enters into your body?  
 a) Coma  
 b) Heavy headache

- c) Problems in eyes  
d) Pain in bone
13. Which one is thermoplastic polymer?  
a) PVC  
b) Bakelite  
c) Fibre glass  
d) Epoxy glue
14. What percentage of aqueous solution of ethanol is called rectified spirit?  
a) 96%  
b) 69%  
c) 90%  
d) 76%
15. During the combustion which one produces less heat?  
a)  $\text{CH}_4$   
b)  $\text{C}_2\text{H}_6$   
c)  $\text{C}_3\text{H}_8$   
d)  $\text{C}_4\text{H}_{12}$