

Hydrogen gas. Is there any similarity in the atoms of these elements?

- b) Helium is an unreactive gas and Neon is a gas of extremely low reactivity. What, if anything do their atoms have in common?

9. Elements X forms a chloride with the formula XCl_2 , which is a solid with a high melting point. X would most likely be in the same group of the Periodic Table as:

- a) Na b) Mg c) Al d) Si

10. Which elements has

- a) Two shells, both of which are completely filled with electrons?
b) The electronic configuration 2, 8, 2.
c) A total of three shells, with four electrons in its valence shell?
d) A total of two shells, with three electrons in its valence shell?
e) Twice as many electrons in its second shell as in its first shell?

11. An atom has electronic configuration 2, 8, 7.

- a) What is the atomic number of this element?
b) To which of the following elements would it be chemically similar?

[Atomic numbers are given in parentheses]

- a) N (7) b) F (9) c) P (15) d) Ar (18)

12. The position of three elements A, B and C in the Periodic Table are shown below -

Group 16	Group 17
-----	-----
-----	A
-----	-----
B	C

- a) State whether A is a metal or non - metal.

- b) State whether C is more metallic or less metallic than A.

- c) Will C be larger or smaller than B?

- d) Which type of ion, cation or anion will be formed by element A?

13. In the Modern Periodic Table calcium [atomic number 20] is surrounded by elements with atomic numbers 12, 13, 21 and 38. Which of these have physical and chemical properties resembling calcium?

14. An element belongs to 3rd period and group 2 of the periodic table. Find out

- a) The number of valence electrons.
b) It is a metal or non - metal?
c) Name the element.
d) Formula of its oxide.
e) Electron dot structure of this element with chlorine.

15. Amongst the following elements of the third period Na, Mg, Al, Si, P, S, Cl

- a) Name the elements with the largest and smallest atomic size.
b) Element with three electrons in its outermost shell.
c) The most electronegative element
d) Most metallic element
e) An element which can gain three electrons to acquire noble gas configuration

- f) Nature of oxide formed by sulphur and phosphorous
16. An element X has atomic number 19.
- Write its electronic configuration and identify the element
 - Identify the group and period to which this element belongs.
 - Name an element which is chemically similar to this element.
 - Predict its valency.
 - Name an element which is smaller in size than X in the period.
 - What will be the nature of the compound formed by reacting X with chlorine?
17. An element has electronic configuration 2, 8, 6.
- To which group and period of the periodic table does it belong?
 - What is the atomic number of this element?
 - Is it metallic or non – metallic and why?
 - Identify the element.
 - Name an element which will be chemically similar to this element.
18. Amongst the following elements of group 2; Mg, Ca, Sr, Ba, Ra. Indicate
- Element with smallest and largest size.
 - Element having to electrons in its fourth shell.
 - Formula of Magnesium with its oxide.
 - Nature of oxide of Magnesium
 - Most reactive element
 - Type of bonding involved between Calcium and Chlorine
19. Amongst the following elements with electronic configuration.
- a) 2, 8, 2 b) 2, 8 c) 2 d) 2, 8, 7 e) 2, 8, 8, 2 f) 2, 5
- Which of them belong to the same group?
 - Which of them belong to the same period?
 - Classify them as metals or non – metals
 - Identify and name the inert gas.
 - Which of them will predict valency one?
20. You have been given a part of the periodic table, Symbols A, B, C, D, E, G are the hypothetical symbols used. On the basis of this table answer the following questions.

Groups Periods	1	2	3 to 12	13	14	15	16	17	18
1.									A
2.		C							
3.	B				D			E	G

- Identify the elements A, B, C, D, E & G.
- Element with smallest size.
- Element placed above D.
- Amongst D and E which is more reactive and why?
- Most metallic element
- Most electronegative element.

- g) A metal with valency 2.
- h) Elements obeying octet rule.
- i) Identify the metalloid.
- j) Formula of D with its oxide

2. THE MAGIC OF CHEMICAL REACTIONS

1. A light sensitive compound 'A' of silver is used in photography. On exposure to sunlight its colour changes to grey.
 - a) Identify 'A'
 - b) Write a chemical equation to express the above change
 - c) Identify the type of chemical reaction
2. Which amongst the following reactions is not possible? Give reason.
 - a) $\text{Fe}_{(s)} + \text{ZnSO}_{4(aq)} \rightarrow \text{FeSO}_{4(aq)} + \text{Zn}_{(s)}$
 - b) $\text{Mg}_{(s)} + \text{ZnSO}_{4(aq)} \rightarrow \text{MgSO}_{4(aq)} + \text{Zn}_{(s)}$
 - c) $\text{Al}_{(s)} + \text{ZnSO}_{4(aq)} \rightarrow \text{Al}_2(\text{SO}_4)_{3(aq)} + \text{Zn}_{(s)}$
3. It is advisable to store ferrous sulphate solution in zinc container? If no why?
4. A element 'X' on reaction with dilute acid evolves a gas that burns with a pop sound, while compound 'Y' on reaction with dilute acid evolves a gas that turns lime water milky. Identify compound 'X' & 'Y'.
5. Give reasons for the following.
 - a) Silver metal doesn't combine easily with oxygen but silver jewellery tarnishes after sometime.
 - b) Aluminium metal combines with oxygen but still it can be used for making kitchen utensils.
6. A solution of copper sulphate was kept in an iron vessel. After a few days, the iron vessel was found to have number of holes in it. Explain giving the relevant chemical equation.
7. A solution of a substance 'X' is used for white washing.
 - a) Name the substances 'X' and write for its chemical formula.
 - b) What happens when 'X' is made to react with water? Write your observation and the relevant chemical equation.
8. A black coloured substance is formed on the surface of copper metal when it is heated in oxygen of air. Give reasons.
9. A metal 'X' acquires a green colour coating on its surface on exposure to air.
 - a) Identify the metal 'X' and name the process responsible for this change
 - b) Name the green coating formed on the metal.
- 10 A students has been collecting silver coins and copper coins. One day she observed a black coating on silver coins & a green coating on copper coins. Which chemical phenomenon is responsible for these coating? What responsible for these coating ? Write the chemical name of black & green coatings.

11. You have given the following materials.
- i) Iron nails
 - ii) Copper sulphate solution
 - lii) Copper powder
 - iv) Ferrous sulphate crystals
- Identify the type of chemical reaction taking place when.
- a) On heating copper powder in the in a China dish, the surface of copper powder turns black
 - b) On immersing the Iron nail in Copper Sulphate solution the colour of solution fades.
 - c) On heating Ferrous Sulphate crystals in a test tube.
12. A solid substance P which is very hard is used in the construction of many buildings, especially flooring. When substance P is heated strongly, it decomposes to form another solid Q and a gas R is given out. Solid. Q reacts with water with release of a lot of heat to form a substance S. When gas R is passed into a clear solution of substances S, then a white precipitate of substance T is formed. The substance T has the same chemical composition as starting substances P .
- (a) What is substance P? Write its common name as well as chemical formula.
 - (b) What is substance Q?
 - (c) What is gas R?
 - (d) What is substance S? What is the clear solution known as?
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3. THE ACID BASE CHEMISTRY

1. Name the acid and the base used to form the following salts
 - a) NaHCO_3
 - b) ZnSO_4
 - c) AlCl_3
2. A chemical compound 'X' is used in soda acid fire – extinguishers and also an ingredient in antacids.
 - a) Identify 'X' and give its chemical reactions.
 - b) Write a chemical equation for its preparation starting from sodium chloride.
 - c) What happens when this compound is heated strongly?
3.
 - a) Write two observations you would make when quick lime is added to water.
 - b) A calcium compound which is yellowish while powder is used as a disinfectant and also in textile industry. Name the compound. Which gas is released when its compound is left exposed to air?
4. Equal lengths of magnesium ribbons are taken in test tubes A and B. Hydrochloric acid is added to test tube A, while acetic is added to test tube B.
 - a) In which of the test tube hissing occurs more vigorously and why?
 - b) Write a chemical reaction to represent the above chemical changes taking place in test tube A & B.
5. A white substance 'X' having a strong smell at chlorine is used to clean a water

tank.

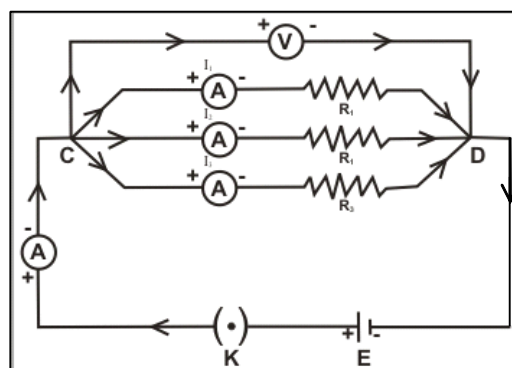
- a) Identify the chemical substances 'X' and give its chemical formula.
 - b) How is the above substance 'X' manufactured? Write the chemical equation for its preparation.
 - c) List two important uses of this compound.
6. When concentrated aqueous solution of substance 'X' is electrolysed, then NaOH, Cl₂ and H₂ are produced.
- a) Name the substance 'X'
 - b) What is the special name of this process and why is it so called?
 - c) Which gas is liberated at anode?
 - d) List one important use of each product obtained .
7. a) A chemical compound 'A' is used in glass and soap industry. Identify the compound and give its chemical formula.
- b) How many molecules of water of crystallization are present in compound 'A'?
 - c) How will you prepare the above compound starting from sodium chloride? Give all relevant equations involved in the process?
8. Observe the following activity and answer the questions based on this activity.
- a) What do you observe in tube 'A'?
 - b) Write a balanced chemical equation for the reaction taking place in test tube 'A'?
 - c) What do you observe when the coloured gas in is passed through solution of calcium hydroxide?
 - d) What happen if sodium carbonate is replaced by sodium hydroxide solution in test tube 'A'?
9. A student prepared solutions of (a) an acid and (b) a base in two separate beakers. She forgot to label the solutions and litmus paper is not available in the laboratory. Since both the solution are colourless, how will she distinguish between the two?
10. Salt A commonly used in bakery products on heating gets converted into another salt B which itself is used for the removal of hardness of water and a gas C is evolved. The gas C when passed through lime water, turns it milky. Identify A, B and C and also give the reaction of A on heating.
11. Name the gases released at anode and cathode by the electrolysis of aqueous

- solution of brine. Give the relevant chemical equation.
12. A substance 'X' is used for disinfecting drinking water. It is also used to bleach pulp in paper industries.
- Identity 'X'
 - How is this substance manufactured? Also, give the relevant chemical equation.
13. Give reasons why?
- The formula of plaster of paris is written as $2\text{CaSO}_4 \cdot \text{H}_2\text{O}$?
 - The blue crystals of copper sulphate pentahydrate turns white when heated?
14. In one of the industrial processes used for manufacture of sodium hydroxide. A gas X is formed as by product. The gas X reacts with lime water to give a compound Y which is used as a bleaching agent in chemical industry. Identify X and Y giving the chemical equation of the reactions involved.
15. If someone is suffering from the problem of acidity after overeating, which of the following would you suggest as remedy?
Lemon juice, Vinegar, Baking soda solution
Give reason for your choice.
16. On adding dilute hydrochloric acid to copper oxide powder, the solution formed is blue green.
- Predict the new compound formed which imparts a blue - green colour solution.
 - Write a balanced chemical equation of the reaction which takes place.
 - On the basis of the above reaction, what can you say about the nature of copper oxide?
17. Which of the following elements would form oxides which would indicate pH values less than seven, using moist pH paper?
Magnesium, Carbon, Sulphur, Hydrogen, Copper
18. The pH value of five solution A, B, C, D and E are given below.
- | | |
|---|----|
| A | 1 |
| B | 5 |
| C | 7 |
| D | 11 |
| E | 13 |
- Classify these solutions as neutral, slightly or strongly acidic and slightly or strongly alkaline.
19. a) Explain why the pH in a person's mouth becomes lower after each meal ?
b) What damage could be caused while pH is low?
c) How could the person change his eating habits to lessen chances of suffering from tooth decay?
20. Hydrochloric acid reacts with a metal X to form a gas Y which burns with a 'pop' sound. Sodium hydroxide solution also reacts with the same metal X (from heating) to form the same gas?.
- Name X and Y.

- b) Write the chemical equation of the reaction of metal X with.
- Hydrochloric acid and
 - Sodium hydroxide solution.
21. The solutions X and Y have pH values of 3 and 9 respectively. Which one of these two will give a pink colour with phenolphthalein indicator?
- Which solution would be most likely to liberate Hydrogen with:
 - What are the acidic range and the alkaline range of pH scale?
 - State one advantage of using pH paper for measuring the pH value of an unknown solution.
22. A metal salt A is blue in colour. When salt A is heated strongly a substance B is eliminated and white powder C is formed. On adding liquid D to white powder it again turns into A. Identify A, B, C, D.
23. A first aid manual says that vinegar should be used to treat wasp sting and baking soda to treat bee sting. What does this tell you about nature of sting.
24. Write the chemical formula for washing soda. How may it be obtained from baking soda? Name an industrial use of washing soda other than washing clothes.

4. THE ELECTRIC SPARK

- Explain what happens to the intensity (Brightness) of light obtained from an electric bulb if the filament of bulb is reduced to half of its length ?
- Why are copper and Aluminium wires usually employed for electricity transmission ?
- Why is tungsten used exclusively for filament of electric bulbs ?
- Why series arrangement not used for domestic electric circuits ?
- What is the importance of fuse in electric circuits ?
- An electric bulb of 67.5 watt was connected to a circuit provided with 250 V voltage and 1 A of fuse. Is it necessary to replace fuse ?
- P and Q are the two wires of same length and different cross sectional areas and made of same metal. Name the property which is same for both the wires and that which is different for both the wires.
- What is the commercial unit of power ? and why ?
- Why is mica sheet used in electric iron ?
- Why electric bulbs are usually filled with chemically inactive nitrogen and argon gases ?
- When a current of 2 A flowing through an appliance of 10Ω . Find the power of appliance.
- Given below is the circuit diagram. Observe the diagram and answer the following questions :
 - How are the resistances connected in the circuit?
 - Will the current flows through



other resistors if it does not flow through R_1 resistor ? Why ?

c) Can you comment on current and potential

difference flowing across resistors.

d) If $R_1 = 5\Omega$, $R_2 = 10\Omega$, $R_3 = 15\Omega$ in the above circuit.

Find their equivalent resistance in the circuit.

5. ALL ABOUT ELECTROMAGNETISM

1. Each appliance in domestic circuit is connected in parallel arrangement. Why ?
2. The resistance of an electric circuit becomes very small during short circuiting. Explain.
3. How an earthing wire in an electric circuit can save us from getting severe shocks ?
4. If a circular coil has 'n' turns the magnetic field produced by it is 'n' times stronger than produced by a single turn. Explain.
5. Why two magnetic lines of force do not intersect ?
6. How sharp and heavy iron scrap material is transported in a steel mill ?
7. Magnetic field lines appear as straight line at the centre of a circular current carrying conductor. Explain.

6. WONDERS OF LIGHT - I

1. Why a watch repairer uses a magnifying glass ?
2. When can a convex lens form a virtual image of a object ? Justify your answer by drawing a ray diagram.
3. A dentist uses a Concave Mirror give reason.
4. Why the bottom of swimming pool appears to be raised ?
5. We totally feel blind for few seconds after entering room from bright sunlight. Give reason.
6. Give reason: Old person find difficulty in reading news paper without spectacles.
7. A person was advised by eye surgeon to wear spectacles of -2.5 D.
 - a) What type of defect the person is suffering from.

- b) What might be reason for the defect of vision.
 - c) What difficulty the person has with that defect in vision.
 - d) What type of lens is used in correcting the above defect.
8. Read the passage carefully and answer the questions :
- a) The doctor checked Ramesh and his wife's eyes and arrived at the following conclusions :-
Ramesh's eyeball was found to be slightly flattered and the image of a near object was formed slightly behind the retina. In case of Ramesh's wife, the image of distant object instead of forming on retina was formed between the eyelens and the retina
- 1) Which eye defect is Ramesh suffering from ?
 - 2) How can his defect be corrected ?
 - 3) Which eye defect is Ramesh's wife suffering from ?
 - 4) What remedy can you suggest for her defect ?
- b) Rajesh is studying in standard X has a spectacle. The number of his spectacle is -1 D. Give the answers for the following questions :-
- 1) Which lenses are used in his spectacles ?
 - 2) Name the defect of vision.
 - 3) What is your conclusion about eyeball ?
 - 4) Find the focal length of the lens.
- c) Anita studying in standard IX is using spectacles. The number of the spectacles is $+0.5$ D. Give answer to the following questions :-
- 1) Give the type of lenses used in her spectacles.
 - 2) State the name of defect of vision in her Eye ?
 - 3) What is your conclusion about her eyeball ?
 - 4) Find the focal length of the lens which is used in spectacles.
9. Answer the following questions based on hypermetropia.
- 1) Shape of eye ball
 - 2) Distance between eye lens and retina
 - 3) In this defect why near object is not seen
 - 4) Which type of lenses are used in spectacles to correct this defect.
10. Bhima was walking in the bright light and enters his house.
Answer the following :-
- 1) How does he find the room in his house (lighted or dark) though lighted.
 - 2) Is he able to see things in the room after some time ? Why ?
 - 3) What is this tendency of pupil of eye called as ?

7. WONDERS OF LIGHT PART - II

- 1. Stop signals are of red colour. Explain.
- 2. Sun is seen for two minutes even after sunset. Why ?

3. Why a spectrum is not observed when white light passes through prisms kept side by side in inverted position ?
4. Stars twinkle but planets do not. Why ?
5. If a spoon is kept in a glass of water it appears to be bent. Why ?
6. Which phenomenon is responsible for blue colour of sky and reddening of sun ?
7. How does dispersion of light take place when it passes through a glass prism ?

8. The astronauts find the sky black, why ?
9. Why does light get scattered when it falls on a rough surface.
10. What are colloidal particles present in the atmosphere.
11. Why is planet considered as an extended source of light ?
12. Why is the apparent position of the heavenly object different from actual position.
13. Spectrum obtained by one glass prism is taken on other inverted glass prism. What happens.
14. Give Reason : Rainbow is not seen at 12 noon in the afternoon.

8. UNDERSTANDING METALS AND NON-METALS

1. Name the process used for converting carbonate ores into oxide form.
2. Name two metals which can react with cold water..
3. Write equation for reaction of
 - a) Iron with steam
 - b) Calcium and potassium with water
 - c) Sodium oxide with water
 - d) Heating of copper in oxygen
4. A student was provided with four sample of Magnesium, Zinc, Sodium, Iron and Copper metal. He subjected them to some chemical treatment. Which one of these
 - a) Will not displace Hydrogen from HCl?
 - b) Will react only with steam to evolve Hydrogen gas?
 - c) Will evolve Hydrogen gas dil. HNO_3
 - d) Will be displaced from its salt solution by all other metals?
5. Why Carbon cannot be used to reduce the oxides of highly reactive metals?
6. A man went door to door posting to a goldsmith. He promised to bring back the glitter of old and dull gold ornaments. An unsuspecting lady gave a set of gold bangles to him which he dipped in a particular solution. The bangles sparkled like new but their weight was reduced drastically. Can you play the detective to find out the nature of solution he had used?
7. a) What are amphoteric oxides? Choose the amphoteric oxides from amongst the following oxides.

Na₂O, ZnO, Al₂O₃, CO₂, H₂O

- b) Why is it that non-metal do not displace hydrogen from dilute acids?
8. The reaction between metal X and Fe₂O₃ is highly exothermic and is used to join railway tracks.
- a) Identify metal X and name the reaction.
- b) Write the chemical equation of its reaction with Fe₂O₃
- c) Also, identify the substance getting oxidized and reduced.
9. An ore of moderately reactive metal 'M' with valency 2 on treatment with dilute Hydrochloric acid react with brisk effervescence to produce a colourless and odourless gas.
- a) Identify the type of ore
- b) What operation will be required to obtain metal from it?
10. 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 non metal? Explain with the help of a suitable example?

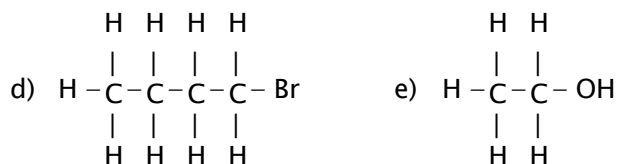
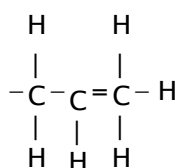
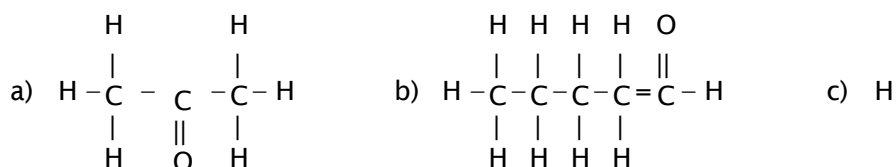


9. AMAZING WORLD OF CARBON COMPOUNDS

1. Alkane are the (a) _____ (analogous/homologous) series of (b)_____ (saturated/unsaturated) hydrocarbon. They differ from alkenes due to the presence of (c) _____ (double/ single) bonds. Alkenes mainly undergo (d)_____ (addition/substitution) reactions.
2. Two carbon compounds A and B have the molecule formula C₃H₈ and C₃H₆ respectively. Which one of the two is more likely is show addition reaction? Justify your answer. Explain with the help of a chemical equation, how an addition reaction is useful in vegetable ghee industry.
3. An organic compound 'A' widely used as preservative in pickles and has a molecular formula C₂H₄O₂. This compound reacts with ethanol to form a sweet smelling compound 'B'.
- i) Identify the compound 'A'.
- ii) Write the chemical equation for its reaction with ethanol to form compound 'B'
- iii) Which gas is produced when compound 'A' reacts with washing soda? Write the chemical equation?
4. An organic compound A having molecular formula C₂H₄O₂ reacts with sodium metal and evolves a gas B which readily catches fire. A also reacts with ethanol in the presence of anhydrous Zinc chloride to form sweet smelling C used in making perfumes.
- i) Identify the compounds A, B and C.
- ii) Write balanced chemical equations to represent the conversion of:

i) Compound A into Compound B ii) Compound A into Compound C.

5. An organic compound A which on addition of one molecule of hydrogen in presence of Ni forms a compound B. Identify the compounds A and B and write the chemical equations of the reactions involved.
6. Name the functional groups present in the following compounds.



7. Name the functional groups presents in the following compounds.
- a) CH_3CHO b) CH_3COCH_3 c) $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$ d) $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$
8. a) Addition of Chlorine to Methane to form Chloromethane is termed as substitution reaction, why?
 b) Which of the following can undergo addition reactions and why?
 C_2H_4 , C_3H_8 , C_3H_6 , C_3H_4 , C_3H_{12}
9. Name the gas evolved when a small piece of sodium.
- a) Metal is dropped into absolute alcohol
 b) How will you test the gas evolved?
 c) Write a chemical equation for the above reaction.
10. a) Why does carbon form largest number of compounds?
 b) Why are some of these called saturated and other unsaturated compounds?
 c) Which of these two is more reactive?
 d) Write the names of the compounds.

