

Defence Exams

Important Chemistry
Notes

CHEMISTRY

MATTER

- **In general it exists in 3 states i.e.,**
 - (i) Solid
 - (ii) liquid
 - (iii) gas.
- Now-a-days there is a discussion on two more states of matter i.e., **Plasma** (Ionised gases containing super energetic and super excited particles and **Bose-Einstein** condensates or BEC (a gas at super low temperatures with extremely low density).

Boiling Point

- The temperature at which liquid converts in to vapours is called its boiling point.
- Boiling point **of water is 100°C.**
- The boiling point **increases in the presence of impurities.** That's why boiling point of **sea water is more than the boiling** point of pure water (as the former contains impurity).
- **It usually decreases at high altitudes,** that's why at high altitudes, the boiling point of water is less than 100°C and **more time is required to cook a food.**

Melting Point

- It is a temperature at which a substance **converts from its solid state to liquid state.**
- Melting point **of ice is 0°C;** It decrease in the presence of impurity

Atom, Molecule and Element

- Atom is the smallest particle of a matter that takes part in chemical reactions, but cannot exist in free state.
- **Atom is made 43 of electrons,** protons and neutrons.
- Protons and neutrons reside in the nucleus (**at the centre of atom**) whereas electrons revolve around the nucleus.
- **Atoms combine to form molecules,** the smallest part of matter which can exist in free state.

Isotopes and Isobars

- **Isotopes have the same number of protons** (i.e., atomic number), but different number of neutrons and mass number (atomic number + number of neutrons), e.g., **$^{11}\text{H}^1, ^{1}\text{H}^2$.**
- **Isobars have the same mass number** but different atomic number.
Example: $^{18}\text{Ar}^{40}, ^{19}\text{K}^{40}$

Dating Techniques

- **Radiocarbon** dating is used to **determine the age of carbon** bearing materials like wood, animal fossils etc.
- **Uranium** dating is used to **determine the age of Earth, minerals and rocks.**

Battery

- Battery is a device, used to convert **chemical energy into electrical energy** and is of two types
 - (i) **Primary batteries** (non-rechargeable) act as galvanic cell, e.g., dry cell, mercury cell etc.
 - (ii) **Secondary Batteries:** (rechargeable) Act as galvanic as well as voltaic cell E.g., lead storage battery, nickel cadmium battery etc.

Corrosion

- The oxidative deterioration of a metal surface by the action of environment is called **corrosion**, an electrochemical process.
- When **iron exposed in to air, iron surface turns brown** due to the formation of **hydrated ferric oxide ($\text{Fe}_2\text{O}_3 \cdot x\text{H}_2\text{O}$)** which is also called rust,
- **Silver - Surface turns black** due to the formation of **silver sulphide (Ag_2S)**

Renewable Non-renewable Natural Resources

- **Renewable resources are available in** large excess, i.e., never ends, e.g, air, sunlight etc.
- **Non-renewable resources are** available in limited quantity and end, if used excessively, after a limited period of time. e.g., mineral, coal, petroleum, natural gas etc.

Fuels

- The substance, which produce heat and light on combustion are called fuels.

- A strong foul smelling substance, called ethyl mercaptan is added to LPG to detect its leakage as LPG is an odourless gas.

Some important fuels and their compositions

Fuel	Composition	Sources
Water Gas	Carbon monoxide (co) + hydrogen(h ₂)	By passing stream over red hot coke
Producer Gas	Carbon monoxide (CO) + Nitrogen (N ₂)	By passing insufficient air over red hot coke
Coal Gas	Hydrogen + methane + Ethylene + Acetyene + CO +Nitrogen	By fractional distillation
Natural Gas	Methane(83%) + Ethane	From petroleum
Liquefied Petroleum Gas (LPG)	Butane (CH ₄) 95%	From petroleum
Compressed Natural Gas (CNG)	Methane (CH ₄) 95%	From petroleum
Biogas or Gobar Gas	Methane (CH ₄) + Carbon dioxide (CO ₂) + Hydrogen (H ₂) + Nitrogen (N ₂)	From organic wastes

Physical and Chemical Changes

- Physical changes are the change, which only affect the physical properties like colour, hardness, density, melting point etc. of matter, but do not affect the composition and chemical properties of matter.
- A physical change is temporary, while a chemical change is **permanent**.
- Crystallisation, sublimation, 'boiling, melting, vaporisation, cutting of trees, dissolving sugar or salt in water etc. are physical changes.
- Chemical changes affect the composition as well as chemical properties of matter and result in the formation of a new substance.
- Burning of fuel, burning of candle and paper, electrolysis of water, photo synthesis, ripening of fruits etc, are examples of chemical changes

- Peat**- 60% C
- Lignite or Brown Coal** – 70% C
- Bituminous** – 60 to 80 % C
- Anthracite Coal – 90% C
- Fame

Flame contains three parts

- Innermost Part**- which is black due to the presence of unburned carbon particles- has lowest temperature.
- Middle part** – is yellow due to incomplete of fuel.
- Outermost part**- which is blue due to complete combustion of fuel is the hottest and used by goldsmith to heat the gold.

Fire Extinguishers

- Water extinguishes fire because **as it evaporates**, the vapours surround the burning substance, cutting off the oxygen supply, thus

Coal

Coal is obtained by carbonization of vegetable matter and is available in different varieties:

inhibiting burning process.

- In case of **electrical or oil (petrol) fires**, water cannot be used as extinguisher. This is because water is a conductor of electricity **and heavier than oil**. Thus, oil floats over it and continues to burn.
- Carbon dioxide, which is generated by the reaction of baking soda with acid, is used to extinguish electrical or oil fires. Quality of petrol is measured in terms of octane number and that of diesel in terms of cetane number.

Safety Matches

In safety matches, the stick consists of a mixture of antimony trisulphide and potassium chlorate at its one end. The box side contains a mixture of powdered glass and phosphorus.

Acids, Bases and Salts

Acids

- These are the substances, which **have sour taste** and turn blue litmus red.
- These are **good conductor of electricity** in aqueous solution.
- Pickles are always kept in glass jar because acid present in them reacts with metal to **produce hydrogen gas**.

Bases

- These are the substances, **which have bitter taste and turn red litmus**, blue.
- They give different colours in acid and base solutions.

Salts

- These are the products of **neutralisation reaction between an acid and a base**.
- **pH** is the measure of **acidity/basicity**.

INORGANIC AND ORGANIC CHEMISTRY

Carbon Dioxide

- It is an acidic oxide of carbon and is used by green plants for photosynthesis. It does not help in burning.
Air and our breath contain carbon dioxide. Thus, when lime water is kept in air or we pass our breath into it, the lime water turns milky.

Carbon Monoxide

- It is a neutral oxide of air and has more affinity towards haemoglobin than oxygen (about 200 times more). That's why in the environment of carbon monoxide – which is a non-poisonous gas – people die for the need of oxygen.
It is dangerous to sleep in an unventilated room with fire burning inside because the fire produces carbon monoxide and carbon dioxide gases.

Plaster of Paris

- It is chemically calcium sulphate hemihydrate ($\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$) and is prepared by heating gypsum – which is calcium sulphate dihydrate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) at 373 K.
- On mixing with water, plaster of Paris further sets into a hard solid, called gypsum. Thus, it is used to plaster fractured bones, for making toys, materials for decoration and for making surfaces smooth.

Portland Cement

- It is a complex mixture of silicates and aluminates of calcium with a small amount of gypsum. Raw materials used for the manufacture of Portland cement are **limestone and clay**.
- The composition of Portland cement is calcium oxide (50-60%), alumina (5-10%), and magnesium oxide (2-3%). Gypsum is added to cement to decrease its rate of setting.
- In cement, if lime is in excess, cement cracks during setting and if lime is less, cement is of weak strength.
- Mortar – a mixture of sand, cement and water is used for joining bricks and plastering walls.
- **Concrete**—a mixture of gravel, sand, cement and water is used for flooring and making roads.
- Reinforced Concrete Cement (RCC)—which is concrete with steel bars and wires is used for constructing roofs, bridges and pillars.

Glass

- Glass—an amorphous solid or super-cooled liquid—contains mainly silica (SiO_2).

Different substances are added to obtain glass of different colours

Colour	Substance Added
Red	Copper oxide (CuO)
Green	Chromium oxide (Cr_2O_3)
Blue	Cobalt oxide (CoO)

Brawn	Iron oxide (Fe ₂ O ₃)
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Heavy water

- Heavy water is water that contains **heavy hydrogen or deuterium**. Deuterium differs from the hydrogen usually found in water, protium, in that each atom of deuterium contains a proton and a neutron. Heavy water may be deuterium oxide, **D₂O** or it may be deuterium protium oxide, DHO. Note: **Heavy water occurs naturally, although it is much less common than regular water. Approximately one water molecule per twenty million water molecules is heavy water.**

Hard Water

- The water in which soluble bicarbonates oil

calcium and magnesium are present, is called temporary hard water and in which soluble sulphates and chlorides of magnesium and calcium are present is called **permanent hard water**.

- The temporary hardness of water is removed by boiling or by adding calcium hydroxide, Ca(OH)₂—the **Clark's process** The permanent hardness of water is removed by adding sodium carbonate (Na₂CO₃), or calgon (sodium hexametaphosphate, Na₂[Na₄(P₃)₆])

Hardening of Oil (Hydrogenation)

Oil, an unsaturated fat when heated with nickel catalyst and hydrogen gets converted into a solid mass, called ghee, a saturated fat. This process is called hardening of oil and is carried out through hydrogenation in the presence of nickel as a catalyst.

Some Important Ores of Metals

Ores - Those minerals from which the metals are extracted commercially and economically and with minimum effort are called Ores of Metals.

Name of Elements	Ores	Chemical Formulae
1. Aluminum (Al)	(a) Bauxite (b) Corundum (c) Kryolite	Al ₂ O ₃ ·2H ₂ O Al ₂ O ₃ Na ₃ AlF ₆
2. Iron (Fe)	(a) Hematite (b) Magnetite (c) IronPyrite (d) Siderite	Fe ₂ O ₃ Fe ₃ O ₄ FeS ₂ FeCO ₃
3. Copper (Cu)	(a) Copper Pyrite (b) Copper Glance (c) Malachite	CuFeS ₂ Cu ₂ S 2CuCO ₃ ·Cu(OH) ₂
4. Zinc (Zn)	(a) Zinc Blende (b) Calamine	ZnS ZnCo ₃
5. Sodium (Na)	(a) Rock Salt (b) Sodium Carbonate	NaCl Na ₂ CO ₃
6. Potassium (K)	(a) Karnalite (b) Salt Petre	KClMgCl ₆ H ₂ O KNO ₃
7. Lead (Pb)	(a) Galena (b) Anglesite	PbS PbCl ₂
8. Tin (Sn)	(a) Tin Pyrites (b) Classiterite	Cu ₂ FeSnS ₄ SnO ₂
9. Silver (Ag)	(a) Silver Glance	Ag ₂ S

10. Gold (Au)	(a) Calve rite (b) Sybarite	AuTe ₂ AgAuTe ₂
11. Mercury (Hg)	(a) Cinnabar (b) Calomel	HgS Hg ₂ Cl ₂
12. Magnesium (Mg)	(a) Dolomite (b) Karnalite	
13. Calcium (Ca)	(a) Lime Stone (b) Dolomite	CaCO ₃ MgCO ₃ CaCO ₃
14. Phosphorous (P)	(a) Phosphorite (b) Floreopetite	Ca ₃ (PO ₄)CaFe ₂ 3Ca ₃ (PO ₄)CaFe ₂

Some Previous Year Questions asked in Defence Exams

1. The father of modern chemistry is ?

- A. Priestley B. Lavoisier
C. Dalton D. Mendeleeff

Ans: B

Antoine Lavoisier was a **French** nobleman and chemist central to the 18th-century chemical revolution and a large influence on both the history of chemistry and the history of biology. He is widely considered in popular literature as the "**father of modern chemistry**".

2. Which one is not metal ?

- A. sulphar B. sugar
C. nitrogen D. all

Ans: All

A **metal** is a material (an element, compound, or alloy) that is **typically hard**, opaque, shiny and has good **electrical** and **thermal** conductivity.

3. Which one is the pure element_?

- A. glass B. cement
C. sodium D. none of these

Ans: C

A pure element is a chemical element consisting of only one stable isotope.

4. What is the elements present in urea ?

- A. C,H,O B. C,N,O
C. C,N,H D. C,O,N,H

Ans: D

Urea is an **organic compound** with the chemical formula CO(NH₂)₂. The molecule has functional group.

5. A radioactive substance emits ?

- A. alpha particle B. beta particle

- C. gamma particle D. all of the three

Ans: All of the three

Radioactive substances are continually producing **three kinds of dangerous** radiation: **alpha particles, beta particles** and **gamma rays**. These types of radiation are invisible to the naked eye, and so you won't see a green glow.

6. The fuel in atomic pile is?

- A. carbon B. sodium
C. petroleum D. uranium

Ans: D

In the pile, the neutron-producing **uranium pellets** were separated from one another by graphite blocks. Some of the free neutrons produced by the natural decay of uranium would be absorbed by other uranium atoms, causing nuclear fission of those atoms and the release of additional free neutrons.

7. Which of the following is the lightest metal?

- A. Mercury B. Silver
C. Lithium D. Lead

Ans: C

The lightest or least dense metal that is a pure element is lithium, which has a density of 0.534 g/cm₃. This makes lithium nearly half as dense as water, so if lithium was not so reactive, a chunk of the metal would float on water.

8. The element present in the largest amount in rocks and minerals is?

- A. carbon B. silicon
C. hydrogen D. aluminium

Ans: B

Silicon is the eighth most common element in the universe by mass, but very rarely occurs as the pure free element in nature. It is most widely distributed in

dusts, sands, planetoids, and planets as various forms of silicon dioxide (silica) or silicates. Over 90% of the Earth's crust is composed of silicate minerals, making silicon the second most abundant element in the Earth's crust after oxygen.

9. German silver is an alloy of?

- A. copper, nickel and silver
- B. silver, copper and aluminium
- C. zinc, copper and nickel
- D. silver, zinc and copper

Ans: C

German silver is a copper alloy with nickel and often zinc. The usual formulation is 60% copper, 20% nickel and 20% zinc.

10. The inert gas abundantly found in widely distributed is?

- A. Xe
- B. Kr
- C. He
- D. Ar

Ans: D

Argon (Ar) is the most prevalent of the noble gases in Earth's crust with the element composing 0.00015% of this crust.

11. Vinegar is used as a condiment, and in the pickling of vegetables and other foods. What is the constituent of vinegar?

- A. Butanoic acid
- B. Methanoic acid
- C. Ethanoic acid
- D. Hexanoic acid

Ans: C

When ethanol reacts with oxygen it forms a weak acid called ethanoic acid. In an open bottle of beer or wine, the reaction happens naturally in the presence of bacteria, and it is the ethanoic acid that can make beer or wine taste sour. Vinegar is typically 4-18% acetic acid by mass. Vinegar is used directly as a condiment, and in the pickling of vegetables and other foods

12. Which one of the following is correct? Setting of plaster of Paris is_.

- A. dehydration
- B. oxidation with atmospheric oxygen
- C. hydration leading to another hydrate
- D. combination with atmospheric carbon dioxide

Ans: D

To make lime plaster, limestone (calcium carbonate) is heated to produce quicklime (calcium oxide). Water is then added to produce slaked lime, which is sold as a wet putty. Additional water is added to form a paste prior to use. The paste may be stored in airtight containers. When exposed to the atmosphere, the calcium hydroxide very slowly turns back into calcium carbonate through reaction with atmospheric carbon dioxide, causing the plaster to increase in strength.

13. Which of the following is the best conductor of electricity?

- A. Ordinary water
- B. Sea water
- C. Boiled water
- D. Distilled water

Ans: B

Sea water is a "good" conductor. It has a resistance and resistance increases by distance. So if you dip a very high voltage electric wire in the ocean, the area around it (even 100 meters or more based on how high it is) gets electric.

14. Which one among the following substances evolved heat when dissolved in water?

- A. Glucose
- B. Fructose
- C. Quick lime
- D. Salt peter

Ans: C

Quicklime is a widely used chemical compound. It is a white, caustic, alkaline, crystalline solid at room temperature. When limestone is heated, at about 1000° C it undergoes thermal decomposition.

It loses carbon dioxide and turns into quicklime (calcium oxide).

15. Which one among the following polymers is used for making bullet-proof material?

- A. Polyvinyl chloride
- B. Polystyrene
- C. Polyethylene
- D. Polyamide

Ans: C

A bullet-proof material is made of polyethylene. It is a higher grade of the plastic found in Tupperware.

16. Hydrogen was discovered by ?

- A. Cavendish
- B. Lavoisier
- C. Rutherford
- D. Scheele

Ans: A

In 1766, Henry Cavendish was the first to recognize hydrogen gas as a discrete substance, by naming the gas from a metal-acid reaction "flammable air".

17. Carbon reacts with metal to form.

- A. Carbide
- B. Carbonate
- C. Hydroxide
- D. Oxide

Ans: A

Carbon reacts with reactive metals, such as tungsten, carbon forms either carbides to form alloys with high melting points.

18. Which one of the following elements is metalloid?

- A. Si
- B. Pb
- C. Ge
- D. C

Ans: C

A metalloid is a chemical element with properties in between metals and nonmetals. Germanium (Ge) is a chemical element. It is a lustrous, hard, grayish-white metalloid in the carbon group.

19. Which one of the following is used in the preparation of antiseptic solution?

- A. Potassium nitrate
- B. Iodine
- C. Iodine chloride
- D. Potassium chloride

Ans: B

Antiseptics are chemical agents that slow or stop the growth of micro-organisms (germs) on external surfaces of the body and help prevent infections.

20. The name catalysis was given by .

- A. Rutherford
C. Graham
- B. landmuir
D. Berzelius

Ans: B

Catalysis is the increase in the rate of a chemical reaction due to the participation of an additional substance called a catalyst. With a catalyst, reactions occur faster and with less energy. Because catalysts are not consumed, they are recycled. Often only tiny amounts are required.

21. Which of the following is not a natural polymer?

- A. Wool
C. Cotton
- B. Silk
D. Teflon

Ans: D

Natural polymers occur in nature and can be extracted. They are often water-based. Examples of naturally occurring polymers are silk, wool, DNA, cellulose, cotton and proteins.

22. Gamma rays are .

- A. High energy electrons
B. Low energy electrons
C. High energy electromagnetic
D. High energy positron waves

Ans: C

Gamma rays (γ) refer to electromagnetic radiation of an extremely high frequency and therefore consist of high-energy photons.

23. The ultrapure metal is obtained by_?

- A. Calcination
C. zone refining
- B. Sublimation
D. None of these

Ans: C

The principal stages in the production of ultrapure metals are the preparation of pure chemical compounds, the reduction of the compounds to the elementary state and further purification. Pure compounds are obtained by sorption, extraction, distillation, rectification, ion exchange, and recrystallization from aqueous solutions

24. The gas used in a refrigerator is_?

- A. cooled down on flowing
B. heated up on flowing
C. cooled down when compressed
D. cooled down when expanded

Ans: D

Common refrigerants used in various applications are ammonia, sulfur dioxide, and non-halogenated hydrocarbons such as propane. Compressing these gasses into liquids they are made to give up their heat.

25. Which one of the following petroleum refinery products has the lowest boiling point?

- A. Kerosene
C. Diesel
- B. Gasoline
D. Lubricating oil

Ans: D

Lubricating oil is the most commonly used lubricant because of its wide range of possible applications. The two basic categories of lube oil are mineral and

synthetic. Mineral oils are refined from naturally occurring petroleum, or crude oil. Synthetic oils are manufactured polyalphaolefins, which are hydrocarbon-based polyglycols or ester oils.

26. Compound having tetrahedral structure is_____.

- A. C₂H₄
C. CH₄
- B. C₂H₂
D. None of these

Ans: C

Methane is a **tetrahedral** molecule with four equivalent **C-H** bonds. Its electronic structure is described by four bonding molecular orbitals resulting from the overlap of the valence orbitals on **C** and **H**.

27. The constant temperature, the product of pressure and volume of a given amount of a gas is constant . This is _____ .

- A. Gay-Lussac law
C. Boyle's law
- B. Charles's law
D. Pressure law

Ans: C

Boyle's law is a **gas law**, stating that the **pressure** and **volume** of a gas have an **inverse** relationship, when temperature is held constant. If **volume** increases, then **pressure** decreases and **vice versa** when temperature is held constant.

28. Modern periodic law had been given by .

- A. Moseley
C. Lothar-Mayer
- B. Mendeleev
D. Lavoisier

Ans: A

In 1913, **H.G.J Moseley** in England proved that the more **fundamental** properties of an element are its **atomic number**. Therefore he suggested that the basis of **classification** of elements should be atomic number.

29. In Nuclear reactors graphite is used as .

- A. Lubricant
C. Linear of the reactor
- B. Fuel
D. Modulator

Ans: D

Nuclear reactors are used at nuclear power plants for **electricity** generation. These are generally **graphite moderated** and CO₂ cooled.

30. An acid is a substance which _____ .

- A. Donates a proton
C. Give H⁺ in water
- B. Accepts an electron
D. All

Ans: D

An **acid** is a **chemical substance** whose aqueous solutions are characterized by a **sour taste**, the ability to turn blue **litmus** red and the ability to react with bases and certain **metals** to form salts.

31. A mixture of carbon monoxide and hydrogen is called_.

- A. Producer gas
C. Natural gas
- B. Water gas
D. None

Ans: B

Water gas is a synthesis gas, containing **carbon monoxide** and **hydrogen**. It is a useful product but requires careful handling due to its flammability and the

risk of carbon monoxide poisoning. The gas is made by passing **steam** over a **red-hot carbon fuel** such as coke.

32. The compound of a metal found in nature is called.

- A. Mineral
C. Flux
B. Ore
D. Slag

Ans: A

Metals are an integral part of our planet and are found in almost all rocks and soils. Most metals form compounds called **minerals**, which are naturally occurring, inorganic solids with regular chemical compositions and crystal structures.

33. Freon is used as .

- A. Oxidant
C. Catalyst
B. Refrigerant
D. Both A and B

Ans: B

Freon uses for a number of halocarbon products. They are stable, nonflammable, moderately toxic gases or liquids which have typically been used as **refrigerants** and as aerosol propellants.

34. Which gas is used in filling electric bulbs_.

- A. Neon
C. Radon
B. Argon
D. Krypton

Ans: B

Argon is used to **fill** incandescent **light bulbs** to inhibit the evaporation of the **tungsten** filaments and increase bulb life.

35. Lead pencil contains .

- A. Lead nitrate
C. Lead peroxide
B. Graphite
D. Lead Sulphate

Ans: B

Most pencil cores are made of **graphite** mixed with a **clay binder** which leaves grey or black marks that can be easily erased.

36. Air is ?

- A. Compound
C. Mixture
B. Element
D. Solution

Ans: C

Pure air is a **mixture** of several gases that are invisible and colourless. It consists of about **78% nitrogen**, **21% oxygen**, and less than **1% of argon, carbon dioxide** and other **gases**, as well as varying amounts of water vapour.

37. Which of the following is a noble gas ?

- A. Argon
C. Oxygen
B. Hydrogen
D. Nitrogen

Ans: A

Noble gas, **any of the seven chemical elements that make up Group 18 (VIIIA) of the periodic**

38. Study of old age is called_?

- A. Gerontology
C. Ornithology
B. Pedology
D. Anthropology

Ans: A

Gerontology is the study of the aging process itself. Geriatrics is sometimes called medical gerontology.

39. The chemical name for common salt .

- A. Sodium chloride
C. Sodium chlorate
B. Sodium hydroxide
D. Potassium chloride

Ans: A

Sodium chloride is also known **common salt** is an ionic compound with the chemical formula **NaCl**, representing a 1:1 ratio of sodium and chloride ions.

40. Liquid metal is ?

- A. Mercury
C. Antimony
B. Sodium
D. None

Ans: A

Liquid metal consists of gallium-containing alloys with very low melting points which are liquid at **room temperature**. The standard metal formerly is **mercury**.

41. Match sticks are made of ?

- A. Red phosphorus
C. led nitrate
B. blue phosphorus
D. None

Ans: A

Red phosphorus is used in matches. Ferrophosphorus, a **combination of phosphorus with iron**, is used as an ingredient in high-strength low-alloy steel.

42. Chemical that is used in photography ?

- A. Copper sulphate
C. Magnesium sulphate
B. Silver bromide
D. None

Ans: B

Silver bromide (**AgBr**) is a **soft pale-yellow, water-insoluble salt well for its unusual sensitivity to light. This property has allowed silver halides to become the basis of modern photographic materials.** AgBr is widely used in photographic films and is believed by some to have been used for making the Shroud of Turin.

43. 'Plaster of Paris' chemically known as .

- A. Sodium Aluminate
C. Sodium bicarbonate
B. Calcium sulphate
D. Sodium acetate

Ans: B

Calcium sulphate is a calcium salt that is used for a variety of purposes. It exists in various forms and states of hydration. **Plaster of Paris** is a mixture of powdered and heat-treated **gypsum**.

44. When iron rusts, its weight_?

- A. decreases
C. Constant
B. increases
D. None

Ans: B

Iron rust when they come into contact with **water** and **oxygen**. They rust faster in salty water or acid rain.

45. Which is not a type of elements?

- A. Metals
C. Metalloids
B. Non Metals
D. Gases

Ans: C

Element is a chemical substance consisting of atoms having the same number of protons in their atomic nuclei.

There are **118 elements** that have been identified. The elements classified as **metalloids** are boron, silicon, germanium, arsenic, antimony, tellurium and polonium.

46. Which acid is present in lemon?

- A. marlic acid
- B. citric acid
- C. lactic acid
- D. tartaric acid

Ans: B

Citric acid is a weak **organic acid** with the formula **C₆H₈O₇**. The **juice** of the **lemon** is about **5%** to **6%** citric acid, which gives a sour taste.

47. What among following is used to produce artificial rain?

- A. copper oxide
- B. carbon monoxide
- C. silver iodide
- D. silver nitrate

Ans: C

Artificial rain is produced by **spraying clouds** with substances like **Silver Iodide** (costly) or cheaper ones like **solid carbon dioxide** (dry ice) or even finely powdered **Sodium Chloride**.

48. Which is used in preparation of dynamite?

- A. glycerol
- B. ethyl alcohol

C. methyl alcohol

D. glycol

Ans: A

Dynamite is an explosive material based on nitroglycerin, using diatomaceous earth or another adsorbent substance such as powdered shells or clay

49. Nail polish remover contains?

- A. benzene
- B. acetic acid
- C. acetone
- D. petroleum ether

Ans: C

The **most** common solvents are **acetone**. It is powerful and effective but can be harsh on skin and nails. Acetonitrile has been used as a nail polish remover.

50. Human bone does not contain_.

- A. calcium
- B. carbon
- C. oxygen
- D. phosphorous

Ans: C

Human Bones are primarily formed from salts of **calcium, carbon** and **phosphate**, the major salt being **hydroxyapatite**.
