SPECIAL 100 CHEMISTRY: UPSC SPECIAL.

Qn 1.

Vinegar → Acetic acid.
Lemon → citric acid.
Tomato → oxalic acid.
Soda water → carbonic acid.
Fats → stearic acid.
Grapes → Tartaric acid.
Milk → Lactic acid.
Apples → maleic acid.
Butter → Butyric acid.
Red Ants → Formic acid.

Qn[2]. Sodium metal is stored in kerosene oil. because of its high reactivity with oxygen and moisture.

Qn(3)

COMPOUND	USES.
potassium Bromide.	Photography
potassium sulphate.	Fertiliser.
potassium Nitrate	Gun powder.
monopotassium tartarate	Bakery.

[4] H_2SO_4 is used in Lead storage battery

[5] The most reactive among halogens is

F > Cl > Br > I

chemical compound · CHEMICAL NAME ·

[6] Baking soda — sodium Bicarbonate
washing soda — sodium carbonate
caustic soda — sodium Hydroxide
Blue vitriol — copper sulphate
Epsom salt — magnesium sulphate

[7] cobalt-60 is synthetic radio isotope used in radiation therapy for treatment of cancer. because it emits high intensity (γ-rays).

[8] **Diamond** is the hardest element used to cut or scratch glass.
↳ purest form of carbon. / allotrope of carbon
↳ Bad conductor of heat & electricity

GRAPHITE
↳ Good conductor of heat & Electricity
↳ It can be used as lubricant in machines
↳ chemically more reactive than diamond.
↳ used in making lead pencil and as a moderator in nuclear reactor
↳ allotrope of carbon.

[9] **Valcunisation**
↳ In this process sulphur is added to natural rubber in order to make it hard and durable.

cracking - Large organic molecules degraded into small compounds of carbon.

Smelting - A metal is extracted from it oxide form by using reducing agent

(10) Astatine, francium and tritium are radioactive Element.

[11] CNG. → methane (95%), Ethane.

COAL GAS. → Hydrogen, methane, carbon monooxide (CO).

WATER GAS → carbon monooxide, Hydrogen ($CO + H_2$)

LPG. → Butane, propane (small amount)

NATURAL GAS → methane, Ethane, propane & Butane (85%)

Producer GAS. → carbonmonoxide, Nitrogen ($CO + N_2$)

[12] Baking soda is used in fire Extinguishers

Quicklime (CaO) is used in manufacture of glass.

Gypsum is used in the making of Plaster of paris.

[13] Philospher's wool :- Zinc oxide is called Philospher's wool

(14) Nitroglycerine is used as an Explosive.

(15) Following gases are Emitted from thermal power plants.

↳ CO_2.
↳ oxides of Nitrogen.
↳ oxides of sulphur.

[15] pH of useful substances:

	pH.
Blood →	7.4.
water →	7.
milk →	6.5
saliva →	6.5.
urine →	4.8

[16]. PHYSICAL & CHEMICAL CHANGES.

Examples of chemical changes.

- ↳ Digesting food.
- ↳ Souring of milk.
- ↳ Burning wood.
- ↳ Rusting of Iron.
- ↳ Baking a cake.
- ↳ Burning of coal.
- ↳ cracking of petroleum
- ↳ fermentation of sugarcane juice.
- ↳ frying of an egg.

Example of Physical changes.

- ↳ melting of Ice.
- ↳ Boiling water.
- ↳ Evaporating alcohal
- ↳ shredding paper
- ↳ crystallisation of compounds. (of salt from sea water)
- ↳ sublimation of dry ice into CO_2 vapor.

(17) The presence of NaCl increases the rate of setting of plaster of paris.

(18) Barium is given to patients before X-ray examination of stomach because barium is good absorber of X-rays.

[19] Sodium thiosulphate or HYPO is used in photography to fix or stabilise (Fixer) the colour of image.

[20] polycarbonates is used for making bullet proof material.

[21] Silica gel is often found in bottle of medicine in tablet or powder form to absorb moistures.

[22] Gypsum is added to cement to slow down its rate of setting.

[23] Liquid sodium is used as a coolant in nuclear reactors.

[24] Aqua-regia is a mixture of Nitric acid and Hydrochloric acid used by alchemists to separte silver & Gold.
$HNO_3 : HCL = 1:3$

[25] Titanium metal is used for making boats because it doesnot corrode by sea water.

[26] Ethyl mercapton or thioethanol is added during filling of LPG cylinders; is a strong smelling agent helps in the detection of gas leakage.

[27] Heavy water or dueterium oxide. (D_2O) is an isotope of hydrogen used as moderator in nuclear reactor to slow down the speed of neutrons.

[28] Nail polish remover contains acetone.

[29] Red phosphorous is mostly used in making of safety matches because it is less reactive than other varites of phosph

[30] chlorofluro carbon (CF_2Cl_2) is also known as freon is used as refrigerants in refrigerators and air conditions.

[31] Chromium oxide in paints makes the colour of paint green.

[32] During Indigestion milk of magnesia or magnesium hydroxide is taken to get rid of stomach pain because it is a base and it neutralises excess acid in the stomach.

[33] The main constituent of gobar gas is methane (CH_4).

[34] Acetylene is a fuel used in gas welding

[35] Ice floats on water because density of ice is less than that of water.

[36] The main constituent of pearl is calcium carbonate.

[37] on the basis of carbon % and calorific value %

Anthracite > Bituminous > Lignite > peat.

↓ Superior quality

↓ Low Grad quality

[38] Rusting of Iron is a chemical changes which increases the weight of iron.

[39] Nichrome is used in Electric heater.

[40] cadmium rod is used in nuclear reactor to slow down the speed of neutrons.

[41] In fireworks crimson red colour is due to presence of barium in fire works.

[42] Inert gas (He, Ne, Ar, Kr, Xe & Rn) are present in atmosphere except Rn.

[43] Helium is light and non-inflammable. used in ballon and weather Indicator.

[44] permanent hardness of water is due to the presence of sulphates of magnesium and calcium.

[45] Temporary hardness is due to bicar-bonates of mg and ca. which can be removed by boiling.

[46] permanent hardness is due chlorides of mg & ca.

[47] **Adiabatic process:-** No Exchange of heat between the system and surroundings.

Isothermal process:- Temperature remains constant.

Isobaric process:- pressure remains constant

[48]. The hight heat of raporisation of water is mainly a result of hydrogen bond.

[49]. Hydrogen has three isotopes. protium (^1_1H), deuterium (^2_1H or D) or Tritium (^3_1T).

[50] Elements having some properties of both metals and nonmetals are Boron, silicon, germenium, Arsenic & Antimony

[51] The bond which is present between water molecules is Hydrogen bond.

[52]. metals used to make wires for safety fuses must have high resistivity & low melting point.

[53] Penetrating power of x-rays can be increased by the potential difference between the cathode and anode.

[54] High Boiling point of water is due to Hydrogen bonding.

[55] Sun has been producing light by nuclear fusion and it is a chemical change.

[56] Tanks of scuba divers are filled with air with Helium (He+O_2) because Helium is not soluble in blood even under high bressure.

[57] All Liquids can be made conducting under the condition of low bressure and high voltage.

Agent	Disease
Arsenic	melanosis.
Fluoride	fluorosis.
Dust (workers of pottery, ceramics & glass industry	silicosis
Noise	presbycusis.

* Hard water does not give lather with soap because it contains calcium and magnesium ions.
* Lithium metal is used in mobile Phone batteries
* cement contains silicates of calcium and Aluminium.
* SiO_2 is main constituent of glass.
* Soaps are sodium or pottasium salt of fatty acids.
* **Important Metals & their ores.**

METALS.	ORES.
Sodium	Nacl.
calcium	Gypsum.
Aluminium	Bauxite.
magnesium	carnallite, Epsom salt.
mercury	cinnabar.
Lead	Galena.
Iron	magnetite & Haematite.
uranium	Pitch blende.

IMPORTANT ALLOYS.

ALLOY	CONSTITUENT
Solder	Lead (Pb) & Tin (Sn).
Brass	copper and zinc.
Bronze	copper and Tin.
German Silver	Cu + Zn + Ni
Stainless steel	Fe + Cr + Ni + C.
Rolled Gold.	Cu + Au.

THANK YOU.

GOOD LUCK.