14. Substances in common use

EXRTRA QUESTIONS

1. What is meant by saturated brine?
Ans– The 25% aqueous solution of salt is called saturated brine.

2. What is meant by Bordeaux mixture?
Ans – Bordeaux mixture is mixture of blue vitriol and slaked lime which is used as fungicide on fruits.

3. What are natural radioactive elements?
Ans – The elements with atomic numbers from 82 to 92 are found to radiate spontaneously in nature. These are called natural radioactive elements.

4. What are Artificial radioactive elements?
Ans– The radioactive elements produced in the nuclear fission processes brought about in the laboratory by bombardment of parties are called artificial radioactive elements.

5. What are detergents?
Ans– Detergents are chemical substances, usually in the form of liquid or powder, which is used for washing things such as clothes or dishes.

6. Write three names of rays which are given out by radioactive substances.
Ans – Alpha rays, Beta rays, Gamma rays

7. What are salts?

Ans – The ionic compounds which do not contain H^+ and OH^+ ions and contain only one kind of cation and anion are called simple salt.

eg. Na_2So_4 , K_3Po_4 , $Cacl_2$.

8. Write name of some salts found in sea water.

Ans – Sodium chloride, Magnesium chloride, Magnesium sulphate, Potassium chloride, Calcium, Magnesium bromide etc.

9. What is meant by fused state of the salt ?

Ans– When salt is heated to a high temperature (about 800^0c) it melts. This is called the fused state of the salt.

10. Which chemicals are used for making soap ?

Ans– Oil or animal fat, aqueous solution of sodium or potassium hydroxide are used to form soap.

11. What is radioactivity ?

Ans – Elements with a high atomic number such as uranium, thorium, and radium have a property of spontaneously emitting invisible, highly penetrating and high energy radiation. This property is called radioactivity.

12. What is Rock salt ?

Ans – Salt which is obtained from a certain type of rock. That salt is called rock salt.

13. What is dye?

Ans – The colored substance which on applying to an article. imparts that color to that article, is called dye.

14. What is meant by ceramic?

Ans – Ceramic is a heat resistant substance formed by kneading an inorganic substance in water and then shaping it and hardening it by heating.

15. When is the nucleus said to be unstable ?

Ans – i) It is the balance of protons and neutrons in a nucleus which determines whether a nucleus will be stable or unstable.
ii) Too many neutrons or protons upset this balance disrupting the binding energy from the strong nuclear forces making the nucleus unstable.

16. Which diseases are caused by artificial food colours ?

Ans – Artificial colors causes cancer also diseases like ADHD (Attention Deficit Hyperactivity Disorder) can affect children due to excessive consumption of foods with artificial colors.

17. How are artificial colors harmful to us which are used in Rangpanchami?

Ans – Because of artificial colors we suffered by blindness, skin cancer, asthma, of the skin, permanent blocking of sweat pores etc.

18. What is the property of Teflon because of which it is used in nonstick wore ?

Ans – 1) The atmosphere and chemical substances have no effect on Teflon
2) Neither water nor oil will stick to Teflon coated articles.
3) Night temperature do not affect Teflon as melting point is 327^0c
4) Teflon coated articles are easy to clean

19) Write the uses of Teflon

Ans – 1) Teflon is poor conductor of electricity therefore, Teflon coated cotises and pass are used in high technology electronics instruments.

2) It is used for making non-stick kitchenware

3) The colored metal sheets of two wheelers and four wheelers are given a Teflon coating to protect them from damage due to high temperature and rain

20) Write the uses of Anodizing

Ans – 1) Anodizing layer forms a protective coating on the metal.

2) Anodized cooking vessels are used as the metal can not leach into the cooked food.

3) In that types of vessels, food is quickly cooked.

21) Write the uses of ceramic.

Ans – Ceramic is bad conductor of electricity, so it is used in electrical instruments also for coating the interior of a kin, the outer surfaces of ships and blades of jet engines.

22) Write the formula of baking soda.

Ans – The formula of baking soda is $NaHCO_3$ i.e. sodium bicarbonate.

23) Write the adverse effect of Deodront

Ans – Aluminum – Zirconium compounds are the most harmful chemicals in the deodorant. Disorders like headce, asthma, respiratory disorders, heart disease are likely to occur

without our knowledge. There is possibility of various skin disorders and also skin cancer due to aluminum chlorohydrates.

24) Match the pair.

'A' group	'B' group
1) Boraux	i) $Na_2So_4 . 10H_2O$
2) Epsom salt	ii) $Bacl_2 . 2H_2O$
3) Barium chloride	iii) $Na_2B_4O_7 . 10H_2O$
4) Sodium sulphate	iv) $Mgso_4 . 7H_2O$

Ans.-

'A' group	Ans
1) Boraux	$Na_2B_4O_7 . 10H_2O$
2) Epsom salt	$Mgso_4 . 7H_2O$
3) Barium chloride	$Bacl_2 . 2H_2O$
4) Sodium sulphate	$Na_2So_4 . 10H_2O$

25) Match the pair.

'A' group	'B' group
1) Saturated Brine	i) Sodium metal free
2) Fused state salt	ii) Basic salt
3) $Caocl_2$	iii) Crystallization of salt
4) $Nahco_3$	iv) oxidation of color

Ans.-

‘A’ group	Ans
1) Saturated Brine	Crystallization of salt
2) Fused state salt	Sodium metal freed
3) $Caocl_2$	Oxidation of color
4) $Nahco_3$	Basic salt

26) Match the pair.

‘A’ Group	‘B’ Group
i) Polycythemia	1) Radium 223
ii) Bone cancer	2) Iodine 123
iii) Hyper thyrodism	3) Phosphorous 32
iv) Detection of touman	4) Cobalt 60

Ans.-

‘A’ Group	Ans
i) Polycythemia	Phosphorous – 32
ii) Bone cancer	Radium 223
iii) Hyper thyrodism	Iodine 123
iv) Detection of touman	Cobalt 60

27) Distinguish between Bathing soap and washing soap.

Bathing Soap	Washing Soap
1) High grades of oils and fats are used	i) Low grades of oils and fats are used

2) In this soap alkali free content not present	2) In this soap free alkali present for cleaning action
3) Expensive perfumes are added	3) Cheaper quality perfumes are added
4) Lather is not formed in hard water.	4) Lather is formed in hard water.

28) Distinguish between Detergents and Soap.

Detergents	Soap
1) It is used in hard water	1) Soap do not give well effect in hard water
2) Ditergent means sodium salt of Alkill Benzene sulphonate	2) Soap means sodium or potassium salts of carboxylic acid.

29) Distinguish between Alpha rays and Beta rays

Alpha rays	Beta rays
i) Alpha rays are positive	i) Beta rays are negative
ii) It's velocity is 1/5 to 1/2o times the velocity of light	ii) It's velocity 1/5 to 9/10 times the velocity of light
iii) It's penetrating power is less as compare to Beta rays.	iii) It's penetrating power is very high
iv) It's mass is 4.0028 u	iv) It's mass is 0.000548 u

30) Distinguish between Alpha rays and Gamma rays.

Alpha rays	Gamma rays
i) It having positive charge	i) It do not having any charge
ii) It's velocity is 1/5 to 1/2o times the velocity of light	ii) It's velocity is same as the velocity of light

iii) It's penetrating power is less	iii) It's penetrating power is very very much high
iv) It's mass is 4.0028 u	iv) It's having no mass

31) What is Bone china?

Ans – Bone china is type of ceramic. Bone china is made by adding some ash of animal bones in the mixture of china clay, Feldspare and fine silica. This Bone china is harder than porcelain.

32) We use anodized cooking utensils now days, why?

Ans.- i) Hard anodized surface of cooking utensils is non – toxic, non – staining and no – reactive with food.

ii) Anodized vessels get heated fast and are not spoiled by excessive heat.

iii) Anodized vessels are tough, durable and do not tarnish or corrode for very long time.

33) Bleaching powder has the odour of chlorine ? why ?

Ans – Bleaching powder undergoes slow decomposition in the presence of carbon dioxide in air. This presence forms chlorine gas.

$$CaOCl_2 + CO_2 \rightarrow CaCO_3 + Cl_2 \uparrow$$

Bleaching powder	Carbon dioxide	Calcium carbonat	Chlorine gas

Hence, Bleaching powder has an odour of chlorine

34) Write the balance chemical equations for the following

a) Reaction of bleaching powder with carbon dioxide.
Ans –

$$CaOCl_2 + CO_2 \rightarrow CaCO_3 + Cl_2 \uparrow$$

Bleaching powder | Bleaching powder | Calcium carbonat | Chlorine gas

Bleaching powder undergoes slow decomposition in the presence of carbon dioxide in air. This reaction forms chlorine gas.

b) Reaction of slaked lime (calcium hydroxide) with chlorine gas Or Preparation of bleaching powder

Ans – When slaked lime means calcium hydroxide reacts with chlorine gas, we get bleaching powder.

$$Ca(OH)_2 + Cl_2 \rightarrow CaOCl_2 + H_2O$$

Calcium hydroxide (Slaked lime) | Chlorine gas | Bleaching powder | Water

lium ate and sodium carbonate reacts with sulphuric acid, it forms sodium sulphate, water and carbon dioxide

$$Na_2Co_3 + H_2So_4 \rightarrow Na_2So_4 + H_2O + Co_2$$

Sodium carbonate | Sulphuric acid | Sodium sulphate | Water | Carbon dioxide

35) The hard water of a well becomes soft on adding soda to it.

Ans – 1) The hardness of water in the wells is due to the presence of chlorides and sulphates of calcium and magnesium in it.

2) In addition of washing soda (Na_2Co_3) to hard water, chlorides and sulphates of calcium and magnesium get converted to their insoluble carbonate salts.
3) These insoluble salts can be separated out to obtain soft water.

Thus, hard water turns soft on the addition of washing soda.

$$Mgcl_2 + Na_2Co_3 \rightarrow MgCO_3 + 2NaCl$$

36) Soap forms a precipitate in hard water ? why ?
Ans – When soap is added to hard water, the Ca^{2+} and Mg^{2+} ions present in hard water react with soap. The sodium salts present in soap are converted to their corresponding calcium and magnesium salts, which are precipitated as scum.

37) What type of colours will you use to celebrate eco – friendly Rang panchami? why?
Ans – 1) In order to celebrate eco – friendly Rang Panchami one should use natural colors extracted from beet root, flowers of flame of forest, spinach, flame tree (gulmohar)
2) By using these natural colors, harmful diseases like asthma, blindness, skin disorders etc. can be avoided.

38) The particles of powder are given an electric charge while spraying them to form the powder coating.
Ans _ While spraying the powder on polished metal surface, the particles of the powder are given an electric charge so that they can be easily directed to the target and form a uniform layers of film on the metal surface.

39) The aluminium article is used as an anode in the anodizing process.

Ans.– 1) Anodizing process involves electrolysis

2) Dilute acid is taken in the electrolytic cell and the aluminum article, which acts as the anode is dipped in it.

3) On passing electric current through the electrolyte, hydrogen gas is released at cathode and oxygen gas is released at the anode.

4) This oxygen gas reacts with the aluminum (anode) and a layer of hydrated aluminum oxide is formed on it.

5) As the protective layer is formed on the anode, it is necessary to use aluminum article (or the article to be coated) as the anode in the anodizing process.

40) Why is the aluminum article used as anode in the anodizing process.

Ans – Anodizing is done by electrolysis. In the electrolytic cell, dilute acid is taken and the aluminum article is dipped in it as anode. When an electric current is passed hydrogen gas is liberated at the cathode and oxygen gas is liberated at the anode. A rection with oxygen takes place and a layer of hydrated aluminum oxide is formed on the anode. This layer can be made attractive by adding colour in the cell during electrolysis.

41) When the radiation coming out from certain radioactive substance is passed through an electric field, marks are found at three places on the photographic plate placed on its path

Ans – 1) Three different types of radiations are given out by a radioactive substance.
2) These radiations are alpha, beta gamma rays.
3) Alpha rays deviate slightly towards negatively charged plate while beta deviate towards positive plate and gamma rays do not deviate at all in electric field. Thus we found three places on photographic plate.

42) When is an atomic nucleus unstable? In industrial field, where is radioactivity used?
Ans – a) Industrial Radiography – Industrial cracks and voids in cost iron articles and iron solder can be detected with the help of gamma rays. For this purpose, isotopes like cobalt – 60, iridium – 192 are used in radiography camera. This technique is used for detecting flows in metal work.
b) Measurement of thickness, density and level – It is necessary to maintain the required thickness in the manufacture of aluminum, plastic, iron sheet of differing thickness In the manufacturing process, a radioactive substance is placed on one side and an instrument to measure radiation on the other. The radiation read by the measuring instrument varies with the thickness of the sheet. Materail inside a packing can also be examined by the same technique.
c) Luminescent paint and radioluminesence – The radioactive substances radium, promethium, tritium with some phosphor are used to make certain objects visible in the dark, for eg. the hands of clocks krypton 85 is used in HID lamps while promethium – 147 is used in portable x – ray units.

d) Use in ceramic articles – Luminous colours are used to decorate ceramic tiles, utensils, plates etc. Earlier uranium oxide was used in these paints.

43) Write the uses of radioactivity in Agriculture field.

Ans – 1) This gases and chromosomes that give seeds properties like fast growth, higher productivity, etc. can be modified by means of radiation.

2) The radioactive isotope cobalt – 60 is used for food preservation.

3) Onions, potatoes are irradiated with gamma rays from cobalt – 60 to prevent their sprouting

4) Strontium – 90 is used as tracer in the research on various crops.

44) Write the uses of radioactivity in the Medical field.

Ans – 1) Bone cancer – Can be treated with strontium – 89, strontium – 90, samarium – 153, and radium – 223.

2) To detect tumors in Brain – Boron – 10, iodine – 131, cobalt – 60, are used in the treatment of brain tumour.

45) Write detail method of powder coating.

Ans – powder coating is a method surface of an iron object to prevent rusting. In this method, a polymer resin, a pigment and other ingredients are melt mixed, cooled and ground into a uniform powder and this powder is sprayed on the polished metal surface by electrostatic spray deposition (ESD) In this method the particles of the powder are given an electrostic

charge due to which a uniform layer of a powder sticks to the metal surface. Then the object is heated in the over along with the coating. A chemical reaction occurs in the layer, resulting in the formation of long cross – linked polymeric chains. This powder coating is highly durable, hard and attractive. powder coating can be done on plastic and medium density fibre (MDF) board in day to day use as well.

46) How are porcelain articles made?

Ans – Porcelain is a hard, translucent and white colored ceramic. It is made by using the white clay called kaolin. found in china. Glass, granite and the mineral feldspar is mixed with kaolin and kneaded with water. The resulting mixture is shaped and fired in a kiln at a temperature of 1200 to 1450^0 C. On firing again after glazing, beautiful articles of porcelain are obtained.

47) What is meant by water of crystallization? Give examples of slats with water of crystallization and their uses.

Ans – The fixed number of water molecules present in the crystal structure of the salts is called water of crystallization.

eg.

1) Alum ($K_2So_4, Al_2(So_4)_3\ 24H_2O$)

Use – It is used in purification of water

2) Blue vitriol ($Cuso_4, 5H_2O$)

Use – It is used in blood test for diagnosing anaemia. also as fungicide on fruits

3) Barium chloride ($Bacl_2$, $2H_2O$)
Use – It is used as pesticided in agriculture

4) Washing soda – sodium carbonate $Na_2Co_3.10H_2O$
Use – It is used for washing clothes also to soften hard water.

48) Explain electrolysis of sodium chloride?
Ans – 1) Its electric current is passed through it, it gets electrolyzed. Releasing hydrogen gas at the cathode and chlorine gas at the anode.

$2Nacl + 2H_2O \rightarrow 2NaoH + cl_2 + H_2 \uparrow$

2) Nacl melts at 800^0 C This is the fused state
When fused salt is electrolyzed. Chlorine gas is released at the anode and liquid sodium metal at the cathode.

49) Explain with neat labeled diagram the nature of radioactive radiation.
Ans – i) when radioactive radiations are allowed to pass through two appositely charged plates they get separated. This method was introduced by Rutherford in 1902
ii) Rutherford and Willard studied the radiation emitted by radioactive substances. For this purpose, the rays were allowed to pass through an electrical field and a photographic plate was held in their path.
iii) It was found that the radiation was divided into three types.
iv) One type of radiation deviated slightly towards rays. while the second type of radiation deviated towards positively

charged plate, called Beta rays. However third type of rays did not deviated at all in electric field called gamma rays.

50) Gives the characteristics of alpha, beta, gamma rays.

Properties	Alpha rays (α)	Beta rays (β)	Gamma rays (γ)
1) Nature	Current of α particles He^{++}	Current of β particles e^{-}	Electromagnetic radiation
2) Mass	4.0028u	0.000548u	No mass
3) Velocity	1/5 to 1/20 times velocity of light	1/5 to 9/10 times velocity of light	Same as velocity of light
4) Deviation in the electric field	Attracted towards –ve charged plate	Attracted towards +ve charged plate	Not deviated
5) Penetrating power	Can penetrate an aluminium sheet of thickness < 0.02 mm	Can penetrate an Al sheet of thickness 2mm	Can penetrate 15 cm thickness lead screen
6) Charge	+2	-1	Neutral

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