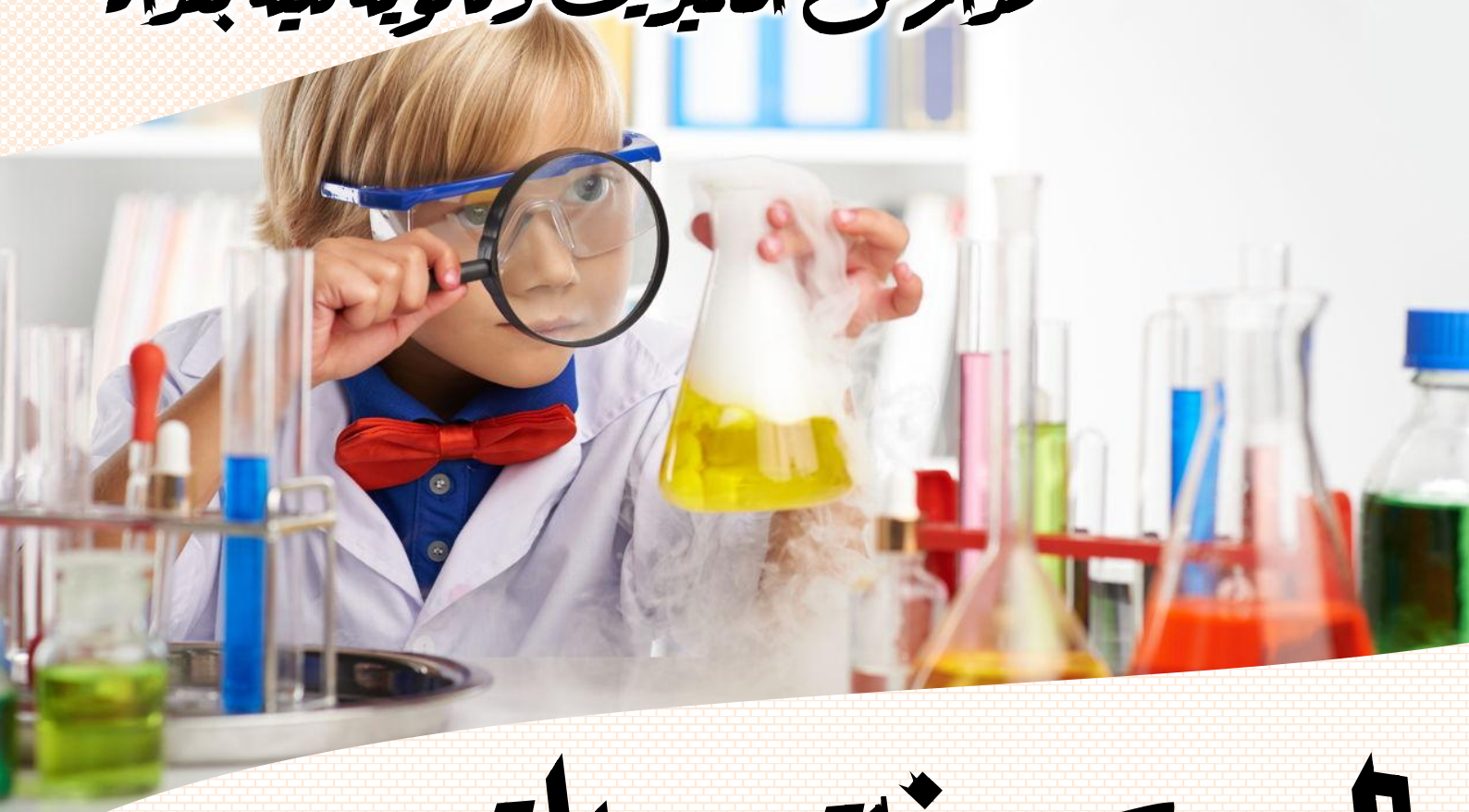
الكيمياء

الاجوبة النموذجية للأسئلة الوزارية

من 2019 لغاية2025

الثالث المتوسط

مدارس المتميزين وثانوية كلية بغداد



الست : فاتن التميمي

كن متميز مع المتميزين

Republic of Iraq -Ministry of Education
Examination in Chemistry for Intermediate Schools

(Firs Term) June : 2019
Time : 3 Hours

Note: Answer (five questions) only .

Q1/A/ if atomic number of an element is (6): *(10 M.)*

1. Write its electrons configuration.
2. How many secondary energy level Filled with electrons
3. What is the number of single electrons
4. Write Lewis Symbol for this atom.
5. Find out Period and group number.

B/ choose the correct answer ? (Do two only) . *(10 M.)*

1. Sodium is preserved in liquid with which it does not react like (kerosene , Ethanol , Nitric acid) .
2. Which color differs chlorine gas from other gases (Red , green , greenish yellow) .
3. Which one of the following percentage of nitrogen in earth's atmosphere (21% , 78% , 50%) .

Q2/ A/ Explain the Reason of followings (choose three only): *(12 M.)*

1. Elements of group IIA are called (Alkaline earth metals)
2. White phosphorous is more active than red phosphorous under normal temperatures .
3. Sulfuric acid used in the production of other acids such as nitric and hydrochloric acids .
4. Sugar in the hot liquid dissolves Faster than that in the cold liquid .

B/ How are Aluminum ions tested in solutions of Aluminum compounds explain and write the chemical equation ? *(8 M.)*

Q3/ A/ write briefly about : (choose three only) *(12 M.)*

Aufbau principle , solubility , silicones , chemical luminance

B/ complete the following statements : (choose two only) *(8 M.)*

1. The Top of the matchsticks is Covered by friction material like .....
2. .....of all other elements has the greatest electronegativity is given number (4) as a measure for its electro negativity.
3. Sulfur is extracted freely in the form of underground deposits by using ..... process.

Q4/A/ How can be produced Ethylene gas in laboratory draw shape of equipment and write the Reaction ? *(12 M.)*

B/ Mark the following Sentence as true (T) or false (F) after that correct the False sentence: (Choose two only) *(8 M.)*

1. Ionization Energy the amount of energy required to Remove one electron from the outer energy level of a gaseous atom .
2. Duralumin Alloy consist of small percentage of Aluminum and a small amount Ratio of copper and magnesium.
3. Acetylene dose not React with the Red bromine water and not remove its color .

Q5/A/ Calculate the mass percentage of methyl Alcohol in a Solution containing (26.5g) of methyl Alcohol and (173.5ml) of water and assume that density of water (1 g/ml). *(10 M.)*

B/ Answer the following:

1. Write uses water glass *(6 M.)*
2. What is the difference between pure salt (NaCl) and impure (NaCl) *(4 M.)*

Q6/A/write the following Reaction: (Choose two only) *(10 M.)*

1) $H_2S + CuSO_4 \longrightarrow$
2) $NH_3 + O_2 \longrightarrow$
3) $Fe + HCl \longrightarrow$

B/ Answer the following: *(10 M.)*

1. Write the physical properties for silicon ?
2. What is the common property between the locations of the following elements in the periodic table ? ($_{15}P$, $_{14}Si$)

Q1 : A : If atomic number of an element is 6 :

1 . Write it's electron configuration . 2 . How many secondary energy level filled with electrons .

3 . What is the number of single electrons . 4 . Write Lewis symbol for this atom ?

Solution

1 . $1s^2\ 2s^2\ 2p^2$

2 . Two

$1s^2$	$2s^2$
↿⇂	↿⇂

3 . ***the number of single electrons are two only.***

$2p^2$		
1	1	

4 . Lewis symbol is • symbol •

Q1 : B :Choose the correct answer ? " Do two only "

1. Sodium is preserved in liquid with which it dose not like
(Kerosene , ethanol , nitric acid) . **Ans (Kerosene)**

2. Which color differs chlorin gas from other gases
(red , green , greenish yellow). **Ans : (greenish yellow)**

3. Which one of the following percentage of nitrogen in earth's atmosphere
(21% , 78% ,50%) . **Ans : (78%)**

Q2 : A : Explain the Reason of following (Choose three only) :

1. Elements of group *IIA* are called " alkaline earth metals" ?

Ans : Because some of their oxides are Known as "alkaline earth".

2. White Phosphorous is more active than red phosphorous under normal temperatures?

Ans : Because atoms of these two forms of phosphorous differ in the way that they bind.

3. Sulfuric acid used in the production of other acids such as nitric and hydrochloric acids

Ans : Because of its high boiling point.

4. Sugar in the hot liquid dissolves faster than that in the cold liquid?

Ans: Because the motion energy of the liquid molecules increases in the hot liquid, making it more likely to collide with surfaces of sugar crystals, this is why it dissolves quickly.

Q2 : B : How are Aluminum Ions tested in solution of Aluminum compounds explain and write chemical equation?

Ans: Aluminum ion is identified in its compounds by basic solution such as sodium hydroxide or potassium hydroxide whereby they react with aluminum ion (Al^{+3}) to form a white gelatin deposit which is aluminum hydroxide $Al(OH)_3$ as in the following formula:

$$\underset{\text{aluminum ion}}{Al^{+3}} + \underset{\text{sodium hydroxide}}{3NaOH} \longrightarrow \underset{\text{aluminum hydroxide}}{Al(OH)_3\downarrow} + \underset{\text{sodium ion}}{3Na^{+}}$$

Q3 : B :Writ briefly about : (Choose three only)

Aufbau Principle: This principle shows: "that secondary energy levels are filled with electrons according to their energy level, from the lowest to the highest".

Solubility: is the maximum amount of a solute which can be dissolved in a given amount of a specific solvent to result in a saturated solution at a given temperature.

Silicones : Are organic compounds of silicon. They aren't poisonous and are very stable along a very wide range of temperature variation.

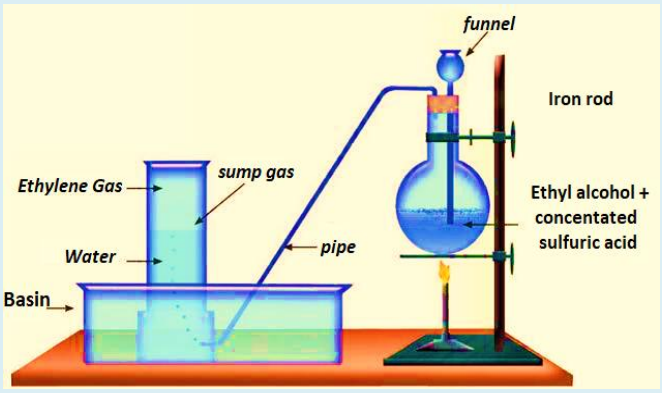
Chemical luminance : The process of white phosphorus flare in the dark when exposed to humid air appears pale green and accompanied by the process of emitting an odor resembling garlic.

Q4 : A : How can you produced Ethylene gas in laboratory draw of equipment and the reaction?

Ethylene can be produced by heating ethyl alcohol C_2H_5OH with sufficient amount of concentrated sulfuric acid up to 170° C .

The sulfuric acid removes water molecule from the of alcohol .

$$\underset{\text{Ethyl alcohol}}{C_2H_5OH} \xrightarrow[170^\circ C]{\text{Concentrated } H_2SO_4} \underset{\text{ethylene}}{C_2H_4}\uparrow + \underset{\text{water}}{H_2O}$$



Q4 :B : Mark the following sentence as true (T) or false (F) after the correct the false sentence ?

1. Ionization Energy the amount of energy required to remove one electron from the outer energy level of a gaseous atom . (T)
2. **Duralumin Alloy:** This alloy consists of a small percentage of aluminum and a small amount ratio of copper and magnesium. (F) . The correct " high percentage of aluminum "
3. Acetylene dose not reacts with the red bromine water and not removes its color.

Ans : (F) It reacts with the red bromine water and removes its color.

Q5 : A : Calculate the mass percentage of methyl alcohol in a solution containing 26.5g of methyl alcohol and 173.5 ml of water and assume that density of water is 1.00g/mL

Solution Mass of methyl alcohol m=27.5g , volume of water V =175 ml

$$\rho\ (g/mL) = \frac{m\ (g)}{V\ (mL)}$$

$m_g = \rho\ (g/mL) \times V_{ml}$ V(ml)

$m_g = 1\ (g/mL) \times 173.5$ (ml)

$m_g = 173.5$ g mass of water

$m_T = 173.5 = 26.5 = 200\ g$

Mass percentage of methyl alcohol = $\frac{m_1}{m_T} \times 100\% = \frac{26.5\ g}{200\ g} \times 100\% = 13.25\ \%$

Q5:B : Answer the following :

1. Writ uses water glass .

Ans : 1 . Providing passive fire protection for textiles and papers.

2 . It is used as a cheap adhesive.

3 . Cement can be strengthened by mixing it with sodium silicate in order to be used in buildings.

2. What is the difference between pure (NaCl) and impure (NaCl) .

Impure salt	*Pure salt*
1- regular salt has the properties of absorbing water (humidity) from air.	*1- not absorb water from air.*
2- contains of calcium chloride or magnesium chloride or both.	*2- not contains chloride magnesium chloride or both.*

Q6: A : Write the following reaction (Choose two only) :

1. $H_2S + CuSO_4$ Ans : $H_2S + CuSO_4 \longrightarrow H_2SO_4 + CuS$
2. $NH_3 + O_2$ Ans : $4NH_3 + 3O_2 \longrightarrow 2N_2 + 6H_2O$
3. $Fe + HCl$ Ans: $Fe + 2HCl \longrightarrow FeCl_2 + H_2$

Q6 : B : What is the common property between the location of the following elements in the periodic table ? ($_{15}P$, $_{14}Si$)

Solution :

$_{14}Si$ $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^2$

$_{15}P$ $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^3$

The common thing "they both have the same period 3rd period "

Republic of Iraq -Ministry of Education (second Role) Sep. : 2019
Examination in Chemistry for Intermediate Schools Time : 3 Hours

Note: Answer (five questions) only.

Q1/A/ A Sample of vinegar contains (4%)of acetic acid by mass . How many grams of vinegar is required to obtain (20g) of acetic acid ? (12 M.)

B/ Complete the following statements ? (Choose two only) (8 M.)

1. .....the amount of energy released when a neutral gaseous atom acquires one electron
2. The Salts of Hydrochloric acid called .....
3. Silicon Dioxide it occurs in nature as pure silica such as ..... (12 M.)

Q2/A/ Write briefly about ? (Choose three only) (8 M.)

Hydrolysis , Hund's Rule , Unsaturated Solution , Hydrocarbons

B/ How are sulfate ions tested in Solutions Explain and write chemical equation? (12 M.)

Q3/A/ How can be produced Ammonia gas in laboratory? Draw shape of equipment and write the reaction ? (8 M.)

B/ Answer the following ?

1. How can we distinguish between Ethylene and Methane gas Explain and write equation ?
2. Write the physical properties of Aluminum ? (10 M.)

Q4/A/An atom the electrons of which are ordered as follows :

$1S^2\ 2S^2\ 2P^1$

1. What is the total number of electrons in this atom ?
2. What is the atomic number ?
3. How many Secondary energy level filled with electrons ?
4. What is the number of single electrons ?
5. Write Lewis symbol for this atom . (10 M.

B/ Choose the correct answer: (Two only)

1. Salt composed from potassium and Aluminum elements (sulfate , Alum , water glass)
2. One of the following free solid molecules contains eight atoms that is
   (Iodine , white phosphorus , sulfur)
3. The simplest compound in the group of hydrocarbons which are called Aromatic Hydrocarbons
   (Benzene , Acetylene , Methane) (12 M

Q5/A/ Explain the Reason of followings : (choose three only)

1. Aluminum does not reacts with both concentrated and dilute nitric acid continually .
2. The liquid nitrogen is used in the petroleum industries .
3. Sodium is used as an active Reducing agent in some of the organic interactions .
4. Why do the Bubbles of (CO_2) consist of in beverages when the cover is Removed ? (8 M

B/ Write the following Reaction equation ? (Choose two only)

1) $NH_4OH + HCl \longrightarrow$

2) $KNO_3 + H_2SO_4 \longrightarrow$

3) $S + Fe \xrightarrow{\Delta}$

Q6/A/ Mark the following sentences as True (T) or false (F) after correct the false sentences . (Choose three only) (1

1. Nobel gases have the greatest ionization energy so they do not lose electrons easily .
2. Silicon has two main forms the first form of silicon is crystallized of dark brown color .
3. The elements in group IA and IIA have High electronegativity and High ionization energy .
4. Red phosphorus is stored in the water container bottles .

/Answer the following :

1. Write uses of Acetylene gas .
2. What are the general properties of group VII (Halogen)?

Q1 : A: *A sample of vinegar contains 4% of acetic acid by mass. How many grams of vinegar is required to obtain 20_g of acetic acids solution ?*

Solution

Percentage mass of solute = $\frac{m_1}{m_T}$ x 100 %

4 % = $\frac{20}{m_T}$ x 100 %

$m_T = \frac{2000}{4}$

m_T = 500 g vinegar need

Q1 :B : Complete the following sentences ? (Choose two only)

1. ---------- the amount of energy released when a neutral gaseous atom acquires one electron.

Ans : Electron affinity

2. The salts of hydrochloric acid called ---------- . Ans : Chlorides .

3. Silicon Dioxide it occurs in nature as pure silica such as ---------- . Ans : quartz and flints.

Q2: A : Write briefly about ? (Choose three only)

Hydrolysis: its process of absorbing water from air being wet like table salt .

Hund's Rule: This rule shows that "no two electrons are doubly occupied in the sub shell (secondary level) unless its orbitals are singly filled".

Unsaturated solution: is the solution, which contains less amount of the solute that is required for saturation at a particular temperature and pressure

Hydrocarbons: It contains only carbon and hydrogen only , either saturated or unsaturated .

Q2: B : How is sulfate ion tested in solution . Explain and write chemical equation ?

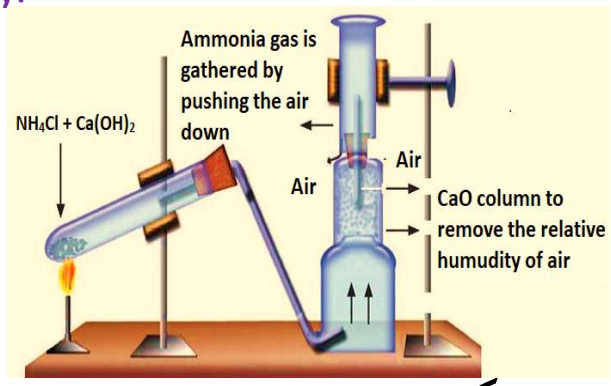
Sulfate ions can be identified in their aqueous solution by adding the solution which contains barium ions such as barium chloride. The result is a white precipitation of barium sulfate: $BaCl_2 + SO_4^{-2} \rightarrow BaSO_4 + 2Cl^-$

Q3 : A : How can be produced ammonia gas in the Laboratory?

Draw the shape of equipment and writ the reaction .

by heating the salt of ammonium chloride with calcium hydroxide ,as in the following equation:

$2NH_4Cl + Ca(OH)_2 \longrightarrow CaCl_2 + 2H_2O + 2NH_3$



Q3 : B : Answer the following ?

1. How can we distinguish between ethylene and gas ? Explain and writ equation.

Ans : Methane does not react with the red bromine water and color does not disappear.

Ethylene, on the other hand reacts with the red bromine water and the color disappears:

Ethylene + red bromine water → red color disappears

Methane + red bromine water → red color doesn't disappear

2. Write the physical properties of the aluminum?

Ans : 1. Aluminum is a fine silvery metal with a remarkable .

2. low density.

3. it is a good conductor for heat and electricity.

Q4 : A : An atom, the electrons of which are ordered as follows. $1s^2\ 2s^2\ 2p^4$

1- What is the total number of electrons in the this atom?
2- What is the atomic number ?
3- How many levels of secondary energy level filled with electrons?
4- What is the number of single electron?
5- Write Lewis symbol for this atom?

Solution

1 . The number of electrons are 8.

2 . The atomic number is" 8 " because it equals to the number of electrons.

3 . The number of secondary levels filled with electrons is only two.

1s	2s
1↓	1↓

4 . It is noted that the number of unpaired electrons are two only.

$2p^4$		
1↓	1	1

5 . Lewis symbol is

Q4 : B : Choose the correct answer (Two only)

1. Salt composed from potassium and aluminum elements (sulfate , Alum , water glass) .

Ans : Alum

2. One of the following free solid molecules containing eight atoms that is (Iodine , white phosphorus , sulfur) .

Ans : sulfur .

3. The simplest compound in group of hydrocarbon, which are called aromatic Hydrocarbons (Benzene , Acetylene , Methane) .

Ans : Benzene .

Q5 : A : Explain the reason of following (Choose three only).

1. Aluminum dose not reacts with both concentration and dilute nitric acid continually ?

Ans: Because of the formation of a layer of aluminum oxide Al_2O_3 this layer isolates the acid from the aluminum and stops the interaction.

2. The liquid nitrogen is used in the petroleum industries?

Ans : To cause an increase in the pressure in the petrol producing wells to push the petrol up the wells.

3. Sodium is used as an active reducing agent in some of the organic interactions?

Ans : Because of its high oxidation.

4. Why do bubbles of CO_2 consist of in beverages when the cover is removed ?

Ans: Because pressure will decrease and making it less soluble and bubbles are formed and moved up in the liquid .

Q5 : B : Write the following reaction equation ? (Choose two only)

1. $NH_4OH + HCl$: Ans : $NH_4OH + HCl \rightarrow NH_4Cl + H_2O$
2. $KNO_3 + H_2SO_4$: Ans : $KNO_3 + H_2SO_4 \longrightarrow KHSO_4 + HNO_3$
3. $S + Fe$ Ans: $S + Fe \xrightarrow{\Delta} FeS$

Q6. A : Mark the following sentences as true (T) or false (F)after that correct the false sentences ?

" Choose three only "

1. ***Noble gases have the greatest ionization energy ss they do not lose electrons easily.*** ***(T)***
2. Silicon has two main forms first form of silicon crystallized of dark brown color. (T)
3. The elements in group IA and IIA have high electronegativity and high ionization energy.

Ans : (F) The correct " have low electronegativity and low ionization energy " .

4. Red phosphorus is stored in the water container bottles.

Ans : (F) (White phosphorus is stored in the water container bottles) .

Q6 : B : Answer the following :

1. Write uses of Acetylene gas .

Ans : ❶ The mixture of the gas and oxygen is used to produce the oxyacetylene for cutting or welding metals.

❷ The gas is used as a raw material in the production of rubber, plastics and acetic acid.

2. What are the general properties of group VII (Halogen) ?

Ans: ❶ Elements of this group are characterized by gradual increase in their atomic numbers:

a . Oxygen and sulfur are considered as non-metal.

b. Selenium and tellurium have non metallic properties.

c . Polonium, it has pure metal properties.

❷ All elements of the group VIA has six electrons in the outer shell .

All elements "hunt" two electrons from other elements in order to have a stable electron configuration similar to that of noble elements.

Republic of Iraq -Ministry of Education
Examination in Chemistry for Intermediate Schools

(Third Role) . . . . : 2019
Time : 3 Hours

Note: Answer (five questions) only .

Q1 /A / If (80 ml) of pure water is added to (20 ml) of sulfuric acid what will be percentage of volume for both sulfuric acid and water ? (12 m)

B / complete the following statement : (Choose two only) (8 m)

1. The Aluminum behavior when react with acids and bases is called ..... .
2. In Ethylene two carbon atoms are bound each other by ..... covalent bonds .
3. Lewis order for $_{14}Si$ .....

Q2/ A / How can be produced acetylene gas in laboratory ? Draw shape of equipment and Write the Reaction . (12 m)

B / Answer the following :

1. Write the physical properties of sodium. (3 m)
2. Write main forms of silicon. (5 m)

Q3/ A / Explain the reason of following : (Choose three only) (12 m)

1. Nobel elements are known to have the lowest electron affinity .
2. Lithium dissolved in water less than another elements of IA group .
3. Silica gel is mainly used as a drier factor.
4. Sulfur used in black gunpowder and fireworks.

B / What are the components for matchsticks paste? (8 m)

Q4/ A/ Write briefly about? (Choose three only.) (12 m)

Electronegativity , solution , sulfate , duralumin .

B / Arrange the following elements according to the increase in their atomic radius : (8 m)

$_{20}Ca$, $_{12}Mg$, $_{4}Be$

Q5/A / How are chlorides tested explain and write the chemical equation? (12 m)

B / Choose the correct answer? (Choose two only) (8 m)

1. Sulfur element occurs in nature in the form (free – combined – free and combined) .
2. Which compound is important for human life and found abundantly in the nature ?
   (sodium chloride – potassium chloride – calcium chloride)
3. All organic compounds contain one of the following elements in their composition :
   (oxygen – nitrogen – carbon)

Q6/A/ Write the following reaction: (Choose two only) (10 m

1. $CH_4 + O_2 \xrightarrow{\Delta}$
2. $Sif_4 + k \xrightarrow{\Delta}$
3. $Na + HCl \rightarrow$

B / Answer the following:

1. Write the uses of Silicon. (4 m)
2. Explain with writing chemical equation how to prepare phosphorus industrial. (6 m)

Q1 : A : If 80 mL of pure water is added to 20 mL of sulfuric acid , what will be percentage of volume for both sulfuric acid and water ?

Solution :

Volume of the sulfuric acid V_1 = 20ml

Volume of water V_2 = 30 ml

Volume of the solution ($V_1 + V_2$) = 20 + 30 = 50 ml

Percentage of volume of the sulfuric acid $= \frac{v_1}{VT} \times 100\ \%$

Percentage of volume of the sulfuric acid $= \frac{20\ ml}{100\ ml} \times 100\ \% = 20\ \%$

Percentage of volume of the water $= \frac{v_2}{VT} \times 100\ \%$

Percentage of volume of the water $= \frac{80\ ml}{100\ ml} \times 100\ \% = 80\ \%$

Q1 : B : Complete the following statement : (Choose two only)

1 . The aluminum behaves when reacts with acids and bases is called ---------- .

Ans : amphoteric behavior.

2. In Ethylene two carbon atoms are bound each other by ---------- covalent bonds.

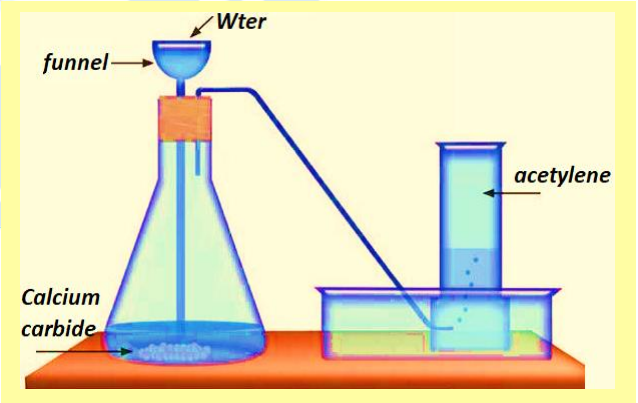
Ans : double .

3. Lewis order for $_{14}Si$ ---------- . Ans : $\cdot\dot{\underset{\cdot}{\overset{\cdot}{Si}}}\cdot$

Q2 : A : How can be produced acetylene gas in Laboratory? Draw shape of equipment and write the reaction .

By putting calcium carbide in an Erlenmeyer flask. Water is added very slowly and gradually using a tube.

The gaseous acetylene which can be collected from the bottle by removing water downward.



$$CaC_2 + 2H_2O \rightarrow C_2H_2\uparrow + Ca(OH)_2$$

Q2 : B : Answer the following :

1 Write the physical properties of sodium?

1. Sodium is a soft metal.
2. has a bright silvery luster when it is readily cut.
3. Its density is less than the density of water.
4. It melts down at (97.81C°).
5. Molten sodium boils at (882.9°C).

2 Write main forms of silicon?

Ans : A. crystallized of dark brown color.

B. non-crystallized of dark gray color.

Q3 : A : Explain the reason of following : (Choose three only)

1. Nobel elements are known to have the lowest electron affinity .

Ans : Because it is very hard to add electrons to them.

2. Lithium dissolved in water less another elements of IA group.

Ans: Because of its small size and the great attraction power of the nucleus on its electrons.

3. Silica gel is mainly used as a drier ?

Ans : Because its large surface and great ability to absorb water.

Q3 : B : What are the components of the top of a paste matchstick ?

a . Flammable material like antimony sulfide Sb_2S_3.

b . An oxidant, like Potassium Chlorate $KClO_3$.

c . Friction material like glass powder.

d. Glue material to bind the ingredients of the paste .

Q4 : A : Write briefly about? (Choose three only)

Electronegativity The tendency of an atom to attract bonded electrons towards itself in any chemical compound .

Solutions: It is homogeneous mixtures composed of two or more pure substance having no chemical reaction between them.

Sulfates are sulfuric acid salts which are derived from the reaction of sulfuric acid with the metals or with their oxides, hydroxides or carbonates .

Duralumin Alloy: This alloy consists of a high percentage of aluminum and a small amount ratio of copper and magnesium. This alloy is light and hard so it is used for building aircraft part

Q4 : B :Arrange the following elements according to increasing in their atomic radius.

$_{20}Ca$, $_{12}Mg$, $_{4}Be$

Solution: $_{20}Ca$ $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2$

$_{12}Mg$ $1s^2\ 2s^2\ 2p^6\ 3s^2$

$_{4}Be$ $1s^2\ 2s^2$

Notice that all the elements in the same group (2) , and the atomic radius increase when atomic number increase , so the arrangement of elements will be as follow $_{20}Ca > {}_{12}Mg > {}_{5}B$

Increasing radius

Q5 : A : How chlorides tested explain and write the chemical equation?

By adding silver nitrate $AgNO_3$ to its solutions such as sodium chloride solution and Hydrogen chloride solution. A white precipitate of insoluble silver chloride is formed in the ammonia solution as in the equations below:

$$AgNO_3 + NaCl \longrightarrow AgCl\downarrow + NaNO_3$$

Silver Nitrate — Sodium Chloride — Silver Chloride (white precipitate) — Sodium Nitrate

Q5 : B : Choose the correct answer ? (Choose two only)

1. Sulfur occurs in nature in the form (free – combined – free and combined).

   Ans : Free and combined .

2. Which compounds is important for human life and found abundantly in the nature ?

   (Sodium chloride – nitrogen – carbon) Ans : Sodium chloride .

3. All organic compounds contain one of the following element their compositions :

   (oxygen – nitrogen – carbon) . Ans : carbon .

Q6 : A : Write the following reaction : (Choose two only)

1. $CH_4 + O_2$ — Ans : $CH_4 + 2O_2 \longrightarrow CO_2 + 2H_2O$
2. $SiF_4 \xrightarrow{\Delta}$ — Ans : $SiF_4 + 4K \xrightarrow{\Delta} Si + 4KF$
3. $Na + HCl$ — Ans: $2Na + 2HCl \longrightarrow 2NaCl + H_2$

Q6: B : Answer the following :

1 Write the uses of silicon .

1 . Electronics industry, electrical appliances and in manufacturing solar cells.

2 . Metal bars used in different industries.

3 . Glass, cement and ceramic industries.

4 . Organic silicon materials which are very important commercially in the production of oils and plastics.

2 Explain with writing chemical equation how to prepare phosphorus industrial?

Ans : Phosphorous is normally produce by heating Calcium Phosphate $Ca_3(PO_4)_2$ with the sand (SiO_2) and carbon C in an electrical oven at high temperature, air-tight , as in the following equation: $2Ca_3(PO_4)_2 + 6SiO_2 + 10C \xrightarrow{1500°C} 6CaSiO_3 + 10CO + P_4$

Republic of Iraq -Ministry of Education *(Firs Role) July : 2021*
Examination in Chemistry for Intermediate Schools *Time : 3 Hours*
Note: Answer (five questions) only .

Q1/ A / How can be produced Nitric acid in Laboratory draw shape of equipment and write the Reaction? (12*M*)

B / Choose the correct answer ? (8 *M*)

1. What is the percentage of Aluminum in Aluminum Bronze alloy? (high - small – 100%)
2. The bond between two carbon atoms in the saturated hydrocarbons is (single – double – triple) .

Q2/A/ Electron configuration for florin $1S^2\ 2S^2\ 2P^5$ (10 *M*)

1. What is the atomic number for florine?
2. What is the number of secondary energy level that full with electrons?
3. What is the number of unpaired electrons?
4. Period and group.
5. Lewis order.

B/ Explain the Reason of following: (choose two only) (10 *M*)

1. Sodium preserved in liquid with which it does not React .
2. Nobel gases have the greatest Ionization energy .
3. Quarts and flints used in cutting glass and scratching stell .

Q3/A/ How are sulfate ions tested explain by chemical equation? (12 *M*)

B/ Complete the following statement: (Choose two only) ? (8 *M*)

1. Salt composed from potassium and Aluminum elements called .....
2. Concentrated solution can be changed into diluted by adding a large amount of the .....
3. Silicon react with oxides or metal carbonates by high heating the resultant compound are known .....

Q4/A/ Write briefly about : (Choose three only) (12 *M*)

Unsaturated Solution – Hydrolysis – hund's Rule – water glass

B/ Explain the preparation of sulfuric acid with industrial method. (8 *M*)

Q5/ A/ Write the following reaction: (Choose two only) (8 *M*)

1. Methan + oxygen gas $\xrightarrow{\Delta}$
2. Nitrogen gas + Hydrogen gas $\longrightarrow$
3. Sodium + water $\longrightarrow$

B/ Sample of vinegar contains (4%) acetic by mass. How many grams of vinegar is required to obtain (20g) of acetic acid? (12 *M*)

Q6/ A/ Mark the following sentences as true (T) or false (f) after correct the false sentences .

(Choose two only) (8 *M*)

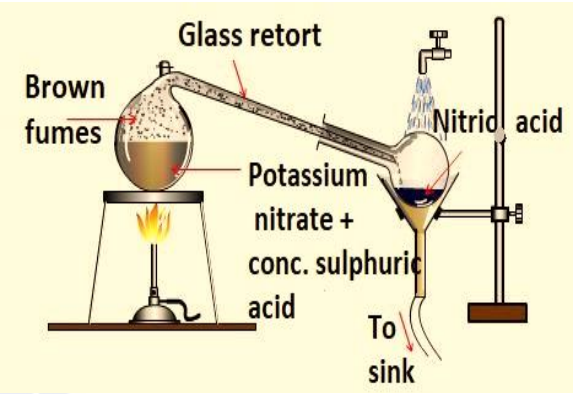
1. The discovery of the nucleus of the element is attributed to the scientist Thomson
2. Elements of group IA called Alkaline earth metal .
3. Reaction of Aluminum with acids and bases this behavior Called Amphoteric behavior

B / Compare the methan and acetylene gas about : (12 *M*)

a. Color and odor
b. Solubility in water
c. Reaction with red bromine solution

Q1 : A : How can be produced Nitric acid in Laboratory ?

Draw shape of equipment and write the reaction ?



Ans : This acid is usually prepared by heating a mixture of Potassium nitrate salt with sulfuric acid in the glass retort, and the nitric acid vapor resulting from the interaction is condensed in a water-cooled vessel .

as the following equation:

$$KNO_3 + H_2SO_4 \longrightarrow KHSO_4 + HNO_3$$

Q1 : B : Choose the correct answer ?

1. What are the percentage of Aluminum in Aluminum bronze alloy ? (high – small – 100%) .

Ans : Small .

2. The bond between carbon atoms in saturated hydrocarbons is (single – double – triple) .

Ans : Single

Q2 : A : Electron configuration for fluorine is $1s^2\ 2s^2\ 2p^5$

1 . What is the atomic number for fluorine .

2 .What is the number of secondary energy levels that full with electrons ,and named it .

3 . What is the number of unpaired electrons in fluorine atom .

4 . Period and group .

5. Lewis order .

Ans : 1 . Ans : 9

2 . Ans : " 2 " $1s^2$ $\uparrow\downarrow$, $2s^2$ $\uparrow\downarrow$

3 . Ans : unpaired electrons , one electron in (2p) $\uparrow\downarrow$ $\uparrow\downarrow$ $\uparrow$

4. group 7 , 2 rd period

5. : F :

Q2 : B : Explain the reason of the following : (Choose Two Only)

1. Sodium preserved in liquids with which it dose not react?

Ans: because its burns when exposed to air.

2. Noble gases Because have the greatest ionization energy .

Ans : Because do not lose electrons easily .

3. Quartz and flints used in cutting glass and scratching steel.

Ans : Because they are highly solid substance .

Q3 : A : How are sulfate ion tested explain by chemical equation?

Sulfate ions can be identified in their aqueous solution by adding the solution which contains barium ions such as barium chloride. The result is a white precipitation of barium sulfate: $BaCl_2 + SO_4^{-2} \rightarrow BaSO_4 + 2Cl^-$

Q3 : B : Complete the following statement : (Choose three only)

1. Salt composed from potassium and aluminum elements---------- . Ans : Alum
2. Concentrated solution can be changed into dilute by adding a larger amount of the ---- .
   Ans : solvent.
3. Silicon reacts with oxide or metal carbonate by high heating the resultant compound are known ---------- . Ans : silicates .

Q4 : A : Write briefly about : (Chose three only)

A saturated solution: is the solution which contains a greater amount of the solute and the solvent can dissolve no more of solute at the given temperature and pressure.

Hydrolysis: its process of absorbing water from air being wet like table salt .

Hund's Rule: This rule shows that "no two electrons are doubly occupied in the sub shell (secondary level) unless its orbitals are singly filled".

Water glass : The concentrated aqueous solution of sodium silicate.

Q4 : B : Explain the preparation sulfuric acid with industrial method .

Ans : Sulfuric acid can be industrially manufactured by contact process :

1. Reaction between sulfur and oxygen to produce sulfur dioxide:

$$S + O_2 \xrightarrow{V_2O_5} SO_2$$

2. The sulfur dioxide is pumped into chamber which contains catalyst to obtain sulfur trioxide

$$2SO_2 + O_2 \longrightarrow 2SO_3$$

Sulfur dioxide — sulfur trioxide

3. After that sulfur trioxide is dissolved in water .

$$SO_3 + H_2O \longrightarrow H_2SO_4$$

Sulfuric acid

Q5 : A: Writ the following reactions : (Choose two only)

1 . Methane + oxygen gas — Ans : $CH_4 + 2O_2 \xrightarrow{\Delta} CO_2 + 2H_2O + energy$

2. Nitrogen gas + hydrogen gas — Ans : $3N_2 + 3H_2 \xrightarrow[\text{Catalyst}]{\Delta} 2NH_3$

3. Sodium + water — Ans : $2Na + 2H_2O \longrightarrow 2NaOH + H_2\uparrow$

Q5: B : A sample of vinegar contains 4% of acetic acid by mass. How many grams of vinegar is required to obtain 20_g of acetic acids solution ?

Solution

Percentage mass of solute = $\frac{m_1}{m_T}$ x 100 %

4 % = $\frac{20}{m_T}$ x 100 %

$m_T = \frac{2000}{4}$

m_T = 500 g vinegar need

Q6. A : Mark the following sentences as true (T) or false (F) after correct the false sentences ?

" Choose two only "

1. The discovery of the nucleus of the element is attributed to the scientist Thomson .

Ans : False (F) . The correct : Retherford .

2. Elements of group IA are called alkaline metals . Ans : True (T)

3. Aluminum reacts with acids and bases this behavior called amphoteric behavior.

Ans : True " T "

Q6 : B : Complete the methane and acetylene gas about :

a. color and odor .
b. Solubility in water .
c. Reaction with red bromine solution .

Ans :

Properties	Methane	Acetylene
Color and odor	Colorless with out odor	colorless gas with a bad smell
Solubility in water	Highly insoluble in water	insoluble in water
Reaction with red bromine solution	not react with the red bromine solution .	reacts with the red bromine solution and remove its color

Republic of Iraq -Ministry of Education
Examination in Chemistry for Intermediate Schools

(Second Role) Oct. : 20
Time : 3 Hours

Note: Answer (five questions) only.

Q1/A/ How can be produced acetylene gas in laboratory ? Draw shape of equipment and write the Reaction. (12 M

B/ Choose the correct answer : (Choose two only) (8 M

1. What is the role of Aluminum for thermite Reaction?
(catalysis , Reducing Agent , oxidizing Agent)
2. Secondary level (d) has five orbitals and maximum hold up electrons: (14 , 10 , 6)
3. All organic compounds contain one of the following elements in their composition:
(oxygen , nitrogen , carbon)

Q2/A/ Calculate the percentage of volume for both acetic acid and water in a solution formed by mixing (20 ml) of acetic acid and (30 ml) of water. (11 M

B/ Complete the following statement: (9 M

1. .....these compounds consist of silicon and Hydrogen .
2. Nitrogen constitutes .....of the earth's atmosphere.
3. Elements of Group II A are called ..... .

Q3/A/ For these two elements $_{12}Mg$ and $_{16}S$: (10 M

1. Write the electronic configuration for them.
2. What is the number of secondary energy levels that full with electrons?
3. Period and group of each.
4. Lewis order for both of them.
5. What is common between these two elements in their Location in the periodic table?

B/ Explain the Reason of following: (Choose two only) (10 M

1. Lithium dissolved in water less than another elements of IA group.
2. Aluminum does not react with both concentrated and dilute nitric acid continually .
3. Silica gel used as drier factor .

Q4/A/ How are ammonia Gas teste explain by chemical equation? (10 M

B/ Write the following Reaction equations: (Choose two only) (10 M

1. Aluminum Hydroxide $\xrightarrow{\Delta}$
2. Ammonium chloride + calcium hydroxide $\xrightarrow{\Delta}$
3. Iron (II) + sulfur $\xrightarrow{\Delta}$

Q5/A/ Write briefly about: (Choose two only) (10 M

Solubility , hydrocarbons , Ionization energy

B/ What is the difference between normal plaster and paris plaster? (10 M

Q6/A/ Properties of VIA group elements are arranged from oxygen to polonium, Write the properties. (10 M

B/ Mark the following sentences as (True) if they are correct or (False) when they are incorrect , then correct the false sentences. (Choose two only) (10 M

1. Crystallized silicon have dark gray color .
2. Solution with large amount of the solute are called concentrated .
3. Aufbau principle that secondary energy level are filled with electrons according to their energy level from the lowest to the highest.

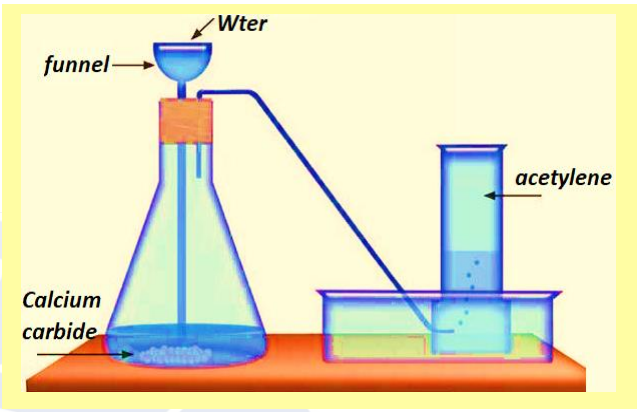
Q1 : A :How can be produced Acetylene in Laboratory ?

Draw shape of equipment and write the reaction ?

Acetylene can be produced by the reaction of calcium carbide, CaC_2 with water.

In the laboratory, acetylene can be produce by putting calcium carbide in an Erlenmeyer flask. Water is added very slowly and gradually using a tube.

The reaction which happens immediately produces the gaseous acetylene which can be collected from the bottle by removing water downward.



$$CaC_2 + 2H_2O \rightarrow C_2H_2\uparrow + Ca(OH)_2$$

Q1 : B : Choose the correct answer : (Choose two only)

1. What is the role of Aluminum for thermite reaction ?

(Catalysis , Reducing Agent , oxidizing agent) Ans : Reducing Agent

2. Secondary level d has 5 orbitals and maximum hold up electrons (14 , 10 , 6)

Ans : 10 electrons

3. All organic compounds contain one of the following element in their compositions :

(oxygen , nitrogen , carbon) . Ans : Carbon .

Q2 : A : Calculate the percentage of volume for both acetic acid and water in a solution formed by mixing 20 ml of acetic acid and 30 ml of water.

Solution : Volume of the solute $V_1 = 20ml$

Volume of solvent $V_2 = 30$ ml

Volume of the solution $(V_1 + V_2) = 20 + 30 = 50$ ml

Percentage of volume of the acetic acid $= \frac{V_1}{VT} \times 100\ \%$

Percentage of volume of the acetic acid $= \frac{20\ ml}{50\ ml} \times 100\ \% = 40\ \%$

Percentage of volume of the water $= \frac{V_1}{VT} \times 100\ \%$

Percentage of volume of the water $= \frac{30\ ml}{50\ ml} \times 100\ \% = 60\ \%$

Q2 : B : Complete the following statement :

1. ---------- this compound consist of silicon and hydrogen . Ans : Silicon hydrates (SiH_4)
2. Nitrogen constitutes ---------- of the earth's atmosphere . Ans : 78%
3. Elements of group IIA are called ---------- . Ans : Alkaline earth metals .

Q 4 : For those two elements $_{12}Mg$ and $_{16}S$

1 . Write the electronic configuration for them .

2 . What is the number of secondary energy levels that full with electrons ?

3 .Period and group of each .

4. Lewis order for both of them ?

5. What is common between these two elements in their location in the periodic table ?

Ans :

1 . $_{12}Mg$ $1s^2\ 2s^2\ 2p^6\ 3s^2$ $_{16}S$ $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^4$ 

2. Mg (4) full secondary energy level S (4) full secondary energy level

3 . $_{12}Mg$ group (2A) / 3rd period

$_{16}S$ group (6) / 3rd period

4 . Lewis : 

5. The common properties between elements location in 3^{rd} the period .

Q3 : B : Explain the reason of following : (Choose two only)

1 . Lithium dissolved in water less another elements of IA group.

Ans: Because of its small size and the great attraction power of the nucleus on its electrons.

2. Aluminum dose not reacts with both concentration and dilute nitric acid continually ?

Ans: Because of the formation of a layer of aluminum oxide Al_2O_3 this layer isolates the acid from the aluminum and stops the interaction.

3. Silica gel is mainly used as a drier ?

Ans : Because its large surface and great ability to absorb water.

Q4 : A : How are ammonia gas teste explain by chemical equation ?

Ans : Ammonia can be detected as following : when ammonia react with hydrogen chloride , it produce white dense vapor which is ammonium chloride.

$$NH_3 + HCl \longrightarrow NH_4Cl \uparrow$$

Q4 : B : Writ the following reaction : (Choose two only)

1. Aluminum Hydroxide Ans : $2Al(OH)_3 \xrightarrow{\Delta} Al_2O_3 + 3H_2O$

2. Ammonium chloride + Calcium hydroxide Ans: $NH_4Cl + Ca(OH)_2 \rightarrow CaCl_2 + 2H_2O + NH_3$

3. Iron (II) + sulfur Ans : $Fe + S \xrightarrow{\Delta} FeS$

Q5: A : Write briefly about : (Choose two only)

Solubility: is the maximum amount of a solute which can be dissolved in a given amount of a specific solvent to result in a saturated solution at a given temperature.

Hydrocarbons: It contains only carbon and hydrogen only , either saturated or unsaturated .

Ionization Energy : The amount of energy required to remove one electron from the outer energy level of a gaseous atom .

Q5 : B : What is the difference between normal plaster and Paris plaster.

Ans :

Normal plaster	Paris plaster
One molecule contains two water molecules $(CaSO_4)_2.2H_2O$	One molecule contains one water molecules $(CaSO_4)_2.H_2O$
When loses one molecule water it turns into a plaster of Paris	When it acquires a water molecule that turns into a normal plaster

Q6: A : Properties of VIA group elements are arranged from oxygen to polonium , write the properties .

Ans :

a . Oxygen and sulfur are considered as non-metal.

b. Selenium and tellurium have non – metallic properties.

c . Polonium, it has pure metal properties.

Q6:A : Mark the following sentences as true (T) or false (F)after that correct the false sentences ?

" Choose two only "

1. Crystallized silicon have of dark gray color. **Ans :** False (F) The correct (dark brown color)
2. Solutions which large amount of the solute are called Concentrated . **Ans : True (T)**
3. Aufbau Principle: That secondary energy levels are filled with electrons according to their energy level, from the lowest to the highest". **Ans :** True (T)

Republic of Iraq -Ministry of Education
Examination in Chemistry for Intermediate Schools

(Third Role) Oct. : 2021
Time : 3 Hours

Note: Answer (five questions) only .

Q1/A/ Write briefly about? (Choose two only) (10 M)
Duralumin Alloy , silicones , solution .

B/ Arrange the following elements according to increasing in their atomic radius? (10 M)
$_9F$, $_8O$, $_3Li$

Q2/A/ Explain the Reason of following. (Choose two only) (10 M)
1. Pure nitric acid after leaving for a period of time is yellow.
2. Sugar in the hot liquid dissolves faster than that in the cold liquid.
3. The electrons don't repel each other in an orbital.

B/ How are Aluminum ions tested in solution of Aluminum compounds explain and write the chemical equation? (10 M)

Q3/A/ How can produced Methane gas in laboratory draw shape of equipment and write the Reaction? (10 M)

B/ Complete the following statement? (Choose two only) (10 M)
1. Lewis order for $_{12}Mg$ .....
2. Sulfur is extracted freely in the form of underground deposits by using ..... process.
3. In Acetylene two carbon atoms are bound each other by .....

Q4/A/ Write the following reaction? (Choose two only) (10 M)
1. Ammonia + hydrogen chloride $\longrightarrow$
2. Sulfur + oxygen gas $\longrightarrow$
3. Calcium Carbide + water $\longrightarrow$

B/ What is the mass ratio of the Solute and the Solvent of a Solution made of (20g) of Salt dissolved in (80g) of Water? (10 M)

Q5/A/ What is the difference between pure salt (Nacl) and impure (NaCl)? (10 M)

B/ what are the general properties of Group IA and IIA elements? (10 M)

Q6/A/ Mark the following sentences as (True) if they are correct or (False) when they are incorrect , then correct the false sentences. (Choose two only) (10 M)
1. Water glass used as a cheap adhesive.
2. Secondary level (F) has seven orbitals and maximum hold up (10) electron.
3. Double Salt of potassium Sulphate and Aluminum called Alum.

B/ Answer the following:
1. Write main forms of silicon (5 M)
2. Give example about organic compound unbranched chain. (5 M)

Q1 : A : Write briefly about ? (Choose two only)

Duralumin Alloy: This alloy consists of a high percentage of aluminum and a small amount ratio of copper and magnesium. It might contain manganese as well. This alloy is light and hard so it is used for building aircraft parts.

Silicones : Are organic compounds of silicon. They aren't poisonous and are very stable along a very wide range of temperature variation.

Solutions: It is homogeneous mixtures composed of two or more pure substance having no chemical reaction between them. the substance with majority in the solution is called the (solvent) and the material with less existence in the solution is called the solute.

Q1 : B : Arrange the following elements according to increasing in their atomic radius. $_9F$, $_8O$, $_3Li$

Solution:

$_3Li$ $1s^2\ 2s^1$

$_6C$ $1s^2\ 2s^2\ 2p^2$

$_9F$ $1s^2\ 2s^2\ 2p^5$

Notice that all the elements in the same period (2) , and the atomic radius decrease when atomic number increase , so the arrangement of elements will be as follow

$_3Li > {}_6C > {}_9F$

Increasing radius

Q2 : A : Explain the reason of following . (Choose two only)

1. **Pure nitric acid after leaving for a period of time is yellow .**

   Ans : Due to containing soluble nitrogen oxides (especially NO_2).

2. **Sugar in the hot liquid dissolves faster than that in the cold liquid?**

   Ans: Because the motion energy of the liquid molecules increases in the hot liquid, making it more likely to collide with surfaces of sugar crystals, this is why it dissolves quickly.

3. **Why the electrons don't repel each other in an orbital ?**

   Ans: Each electron spins around itself at the same time as it spins around the nucleus, when two electrons are coupled in, when two electrons are coupled in one orbital one would spin clockwise and the other would spin anticlockwise i.e., they cancel repulsion in this way.

Q2: B : How to Test of Aluminum Ions tested in solution of aluminum compounds explain and write chemical equation?

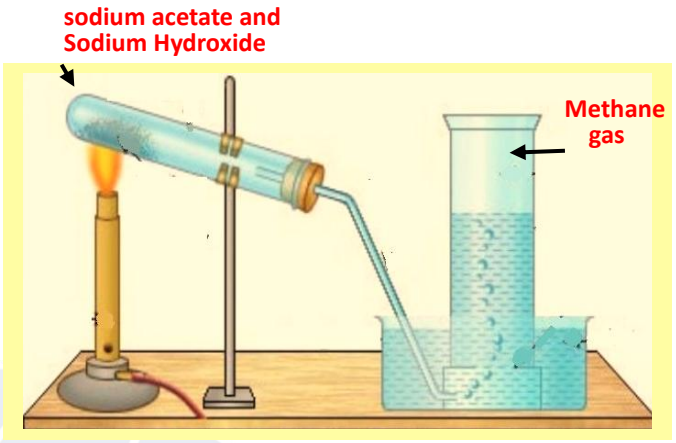
Ans: Aluminum ion is identified in its compounds by basic solution such as sodium hydroxide or potassium hydroxide whereby they react with aluminum ion (Al^{+3}) to form a white gelatin deposit which is aluminum hydroxide $Al(OH)_3$ as in the following formula:

$$\underset{\text{aluminum ion}}{Al^{+3}} + \underset{\text{sodium hydroxide}}{3NaOH} \longrightarrow \underset{\text{aluminum hydroxide}}{Al(OH)_3\downarrow} + \underset{\text{sodium ion}}{3Na^+}$$

Q3 : A : How can be produced Methane gas in Laboratory ?

Draw shape of equipment and write the reaction ?

Ans: Methane is prepared whereby sodium acetates is heated at high temperature along with sodium hydroxide or calcium hydroxide (because the mixture will have little effect on glass and ensures higher melting point for sodium hydroxide) in a test tube , the resulting gas is collected by removing the water further down.



$$\underset{\text{sodium acetate}}{CH_3COONa} + \underset{\text{Sodium Hydroxide}}{NaOH} \xrightarrow{\Delta} \underset{\text{Methane}}{CH_4\uparrow} + \underset{\text{sodium Carbonate}}{Na_2CO_3}$$

Q3 : B : Complete the following statement ? (Choose two only)

1. Lewis order for $_{12}Mg$ ----------. Ans : . Mg .
2. Sulfur is extracted freely in the form of underground deposits by using ---------- process .
   Ans : Frash .
3. In acetylene gas two carbon atoms are bound other by ---------- . Ans : Double bond

Q4 : A : Write the following reactions ? (Choose two only)

1. Ammonia + hydrogen chloride Ans : $NH_3 + HCl \longrightarrow NH_4Cl$
2. Sulfur + oxygen gas Ans : $S + O_2 \longrightarrow SO_2$
3. Calcium carbide + Water Ans : $CaC_2 + 2H_2O \longrightarrow C_2H_2 + Ca(OH)_2$

Q4 : B : What is the mass ratio of solute and the solvent of a solution made of (20 g) of salt dissolved in (80g) of water ?

Solution :

$m_T = m_1 + m_2 = 20 + 80 = 100\ g$

Mass ration of salt = $\frac{(m_1)}{(m_T)} \times 100\ \%$

Mass ration of salt = $\frac{20}{100} \times 100\ \% = 20\ \%$

Mass ration of water = $\frac{(m_2)}{(m_T)} \times 100\ \%$

Mass ration of water = $\frac{80}{100} \times 100\ \% = 80\ \%$

Q5 : A : What is the difference between pure (NaCl) and impure (NaCl) .

Impure salt	Pure salt
1- regular salt has the properties of absorbing water (humidity) from air.	1- not absorb water from air.
2- contains of calcium chloride or magnesium chloride or both.	2- not contains chloride magnesium chloride or both.

Q5 : B : What are the General properties of group IA and IIA elements ?

1. The elements of these two groups have low electronegativity and low ionization energy.
2. The outer shells of all the elements in group IA have one electron whereas the outer shells of the elements in group IIA have two electrons.
3. Because of their reactivity they cannot occur in the free form in nature.

Q6 : A : Mark the following sentence as true (T) or false (F) after the correct the false sentence ? (Choose two only)

1. Water glass used as a cheap adhesive . Ans : True (T)
2. Secondary level (F) has seven orbitals and maximum hold up (10) electrons .
   Ans : False (F) . the correct [14 electrons]
3. Double salt of potassium sulphate and aluminum called alum . Ans : True (T)

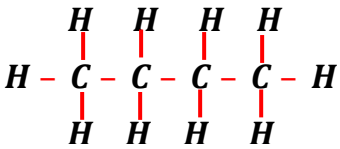
Q6 B : Answer the following :

1. Write the main forms of silicon .

Ans : The first form is crystallized of dark brown color.
The second form is non-crystallized of dark gray color.

2. Give an example about organic compound unbranched chain .

Ans :



(unbranched chain) Butane

Republic of Iraq - Ministry of Education *(Firs Role) June : 2022*
Examination in Chemistry for Intermediate Schools *Time : 3 Hours*

Note: Answer (five questions) only, (20 Marks for each question).

*Q1)*A/ An atom the electrons of which are ordered as follows: $1S^2$ $2S^2$ $2P^4$ (12 M.)
1. What is the total number of electrons in this atom?
2. What is the atomic number?
3. How many Secondary energy Level filled with electrons?
4. Write Lewis symbol for this atom.
5. What is the number of single electrons?
6. Find out period and group.

B/ Explain the Reason of following: (Choose two only) (8 M.)
1. Table salt is a hydrated substance.
2. Duralumin Alloy used for building aircraft parts.
3. Silicon used in manufacturing of electrical devices and computer industry.

*Q2)*A/ How are sulfate ions tested explain and write the chemical equation? (12 M.)
B/ Write briefly about? (Choose two only) (8 M.)
Hund's Rule , bauxite , unsaturated solution.

*Q3)*A/ Calculate the mass percentage of methyl Alcohol in a solution containing *(27.5 g)* of methyl Alcohol and *(175 ml)* of water and assume the density of water *(1 g/ml)*. (12 M.)
B/ Complete the following statement: (Choose two only) (8 M.)
1. ..... half of the minimum distance between two identical and chemically combined nuclei of the element.
2. Large quantities of ammonia can be produced industrially by ..... process.
3. Sodium is stored in ..... .

*Q4)*A/ How can be produced Ethylene gas in Laboratory draw shape of equipment and write the reaction? (12M.)
B/ Mark the following sentences as (True) or (False) after that correct the false sentence: (Choose Two only) (8 M.)
1. In ancient times nitrogen gas it was called " Azote " .
2. Silicon forms a great number of compounds such as silicon hydrates which consist of silicon and carbon.
3. The bond between two carbon atoms in a saturated hydrocarbons is a double.

*Q5)*A/ Answer the following: (12 M.
1. Write the physical properties of Aluminum.
2. What is the difference between dilute and concentrated solution?

B/ Write the following reaction: (Choose two only) (8 M.
1. Sodium hydroxide + Carbon dioxide $\longrightarrow$
2. Calcium Carbide + water $\longrightarrow$
3. Silicon tetra fluoride + potassium $\longrightarrow$

*Q6)*A/Answer the following : (12 M
1. Write the uses of water glass.
2. Explain the preparation of sulfur dioxide gas with industrial method and write chemical equat
(8 M

B/ what is the important properties of the group (VA) elements? (two only)

Q1: A : The electrons of which are ordered as follows $1s^2\ 2s^2\ 2p^4$:

1 . What is the total number of electrons in the this atom? 2. What is the atomic number ?

3. How many levels of secondary energy level filled with electrons?

4. What is the number of single electron? 5. Write Lewis symbol for this atom?

6. Find the period and group

Solution

1 . The number of electrons are 8.

2 . The atomic number is" 8 " because it equals to the number of electrons.

3 . The number of secondary levels filled with electrons is only two.

1s	2s
1↓	1↓

4 . Lewis symbol is ·· · symbol · ··

5 . It is noted that the number of single electrons are two only in $2p^4$

1↓	1	1

6. Period 2 , group 6

Q1 : B : Explain the reason of the following (Choose two only)

1. Table salt is a hydrated substance .

Ans : Because it's contains impurities of calcium chloride or magnesium chloride or both .

2. Duralumin Alloy used for building aircraft parts .

Ans : Because this alloy is light and hard .

3. Silicon used in manufacturing of electrical devices and computer industry.

Ans : Because it is a semi-conductor.

Q2 : A : How are sulfate tested explain ad write the chemical equation .

Ans : Sulfate ions can be identified in their aqueous solution by adding the solution which contains barium ions such as barium chloride. The result is a white precipitation of barium sulfate: $BaCl_2 + SO_4^{-2} \rightarrow BaSO_4 + 2Cl^-$

Q2 : B : Write briefly about ? (Choose two only)

Hund's Rule: No two electrons are doubly occupied in the sub shell (secondary level) unless its orbitals are singly filled.

Bauxite : It is the aqueous Aluminum oxide $Al_2O_3 . 2H_2O$ **and the main source of aluminum extraction .**

An unsaturated solution: is the solution, which contains less amount of the solute that is required for saturation at a particular temperature and pressure.

Q3 : A : Calculate the mass percentage of methyl alcohol in a solution containing 27.5g of methyl alcohol and 175 ml of water and assume that density of water is $1.00 g/mL$

Solution Mass of methyl alcohol $m=27.5g$, volume of water $V=175\ ml$

$$\rho\ (g/mL) = \frac{m\ (g)}{V\ (mL)}$$

$$m_{\ g} = \rho\ (g/mL) \times V_{\ ml}\ \ V(\ ml\ )$$

$$m_{\ g} = 1\ (g/mL) \times 175\ (\ ml\ )$$

$$m_{\ g} = 175\ g \quad \text{mass of water}$$

Mass percentage of methyl alcohol = $\frac{m_1}{m_T} \times 100\%$

$$= \frac{27.5\ g}{202.5\ g} \times 100\% = 13.6\ \%$$

Q3 : B : Complete the following statement : (Choose two only)

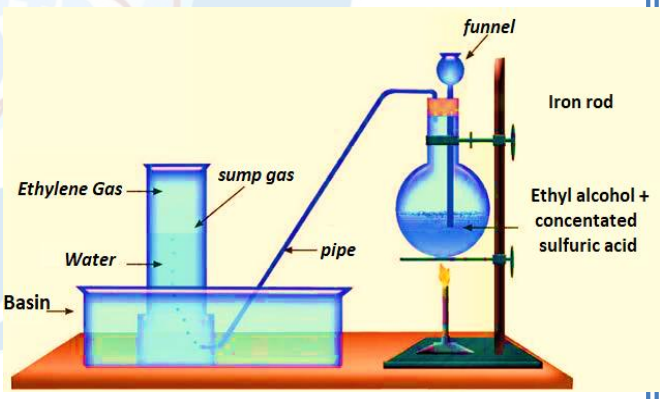
1. ---------- Half of the minimum distance between two identical and chemically combined nuclei of the element . **Ans :** Atomic Radius
2. Large quantities of ammonia can be produced industrially by -------- process . **Ans :** Haber – Bosch
3. Sodium is stored in ---------- . **Ans :** In the liquid that dose not react with sodium .

Q4 : A : How can be produced Ethylene gas in Laboratory ?
Draw shape of equipment and write the reaction ?

Ans:

Ethylene can be produced by heating ethyl alcohol C_2H_5OH with sufficient amount of concentrated sulfuric acid up to 170° C .

The sulfuric acid removes water molecule from the of alcohol .



$$\underset{\text{Ethyl alcohol}}{C_2H_5OH} \xrightarrow[H_2SO_4]{\text{Concentrated}} \underset{\text{ethylene}}{C_2H_4 \uparrow} + \underset{\text{water}}{H_2O}$$

Q4 : B : Mark the following sentences as true (T) or false (F) after correct the false sentences ?
" Choose two only "

1. In ancient times nitrogen gas was called Azote . **Ans :** True (T) .
2. Silicon forms a great number of compounds such as silicon hydrates which consist of silicon and carbon . **Ans :** False (F) the correct :consist of silicon and hydrogen .
3. The bond between two carbon atoms in a saturated hydrocarbons is a double . **Ans :** False (F) The correct : Single

Q5 : A : Answer the following :

1 Write the physical properties of the aluminum?

1. Aluminum is a fine silvery metal with a remarkable . 2. low density.
3. it is a good conductor for heat and electricity.

2 What are difference between Dilute and concentration solution: Ans :

Dilute solution	concentrated solution
contains a relatively small amount of solute المذاب من نسبياً كمية قليلة على يحتوي	contains a large amount of solute المذاب من كبيرة كمية على يحتوي

Q5 : B : Write the following reaction : (Choose two only):

1. Sodium hydroxide + Carbon dioxide : Ans : $2NaOH + CO_2 \longrightarrow Na_2CO_3 + H_2O$
2. Calcium carbide + Water : $CaC_2 + 2H_2O$ Ans : $CaC_2 + H_2O \longrightarrow C_2H_2\uparrow + Ca(OH)_2$
3. Silicon tetra fluoride + potassium : Ans : $SiF_4 + 4K \xrightarrow{\Delta} Si + 4KF$

Q6: A : Answer the following :

1 Write the uses of water glass .

Ans :

1 . Providing passive fire protection for textiles and papers.
2 . It is used as a cheap adhesive.
3 . Cement can be strengthened by mixing it with sodium silicate in order to be used in buildings.

Q6 : B : What is the important properties of the group VA elements ? (Choose two only)

1. Vary gradually from being nonmetals (nitrogen and phosphorus) to metals (bismuth).Arsenic and antimony are metalloid.
2. Nitrogen is gaseous. The rest of the elements are solids in normal conditions. The chemical properties vary on a regular basis from phosphorus to bismuth.
3. Other elements like bismuth and arsenic form ionized compounds.
4. The acidic and basic properties of the elements' oxides also vary from being acidic (phosphorus) to basic (bismuth).

2 Explain the preparation of sulfur dioxide gas with industrial method and write chemical equation .

Ans : By the combustion of sulfur in air. The molten sulfur is pumped in special combustion towers. The resultant gas contains some impurities which need to be removed.

$$S + O_2 \xrightarrow{\Delta} SO_2$$

Republic of Iraq - Ministry of Education *(Second Trial) Sep. : 2022*
Examination in Chemistry for Intermediate Schools *Time : 3 Hours*

اسم الطالب : الرقم الامتحاني

Note: Answer (five questions) only, (20 Marks for each question).

Q1/A/ (5g) of copper sulfate is dissolved in (20g) of pure water calculate mass percentage of solute and solvent ? (12 M.)

B/ Complete the following statement ? (Choose two only) (8 M.)

1. Silicon dioxide (silica) it occurs in nature as a pure such as .....
2. .....are sulfuric acid salts.
3. In the periodic table the elements that assemble the Right of periodic table are .....

Q2/A/ Write briefly about ? (Choose three only) (12 M.)

Saturated solution , Hydrocarbons , Water glass , Termite process

B/ Write Lewis symbol for each of the following : $_{16}S$, $_{5}B$ (8 M.)

Q3/A/ Arrange elements by decreasing in their atomic size : $_{2}He$, $_{18}Ar$, $_{10}Ne$ (12 M.)

B/ Explain the reason of following ? (Choose two only) (8 M.)

1. Sliced sodium loses its shining after some time.
2. Pure nitric acid after leaving for a period of time is yellow.
3. Silica gel used as drier factor.

Q4/A/Answer the following : (12 M.)

1. What are the general features of the organic compounds ?
2. Write uses Alum.

B/ Write the following reaction: (Choose two only) (8 M.)

1. $H_2S + CuSO_4 \longrightarrow$
2. $Na + HCl \longrightarrow$
3. $NH_4Cl + Ca(OH)_2 \longrightarrow$

Q5/A/ How can methane gas be produced in laboratory draw shape of equipment and write the reaction? (12 M.)

B/ Choose the correct answer: (Choose two only) (8 M.)

1. Which one is the first group elements? (Sodium , Radium , Boron)
2. Sulfur element occurs in nature in the form (only free , only combined , free and combined)
3. Which one of the following percentage of nitrogen in earth's atmosphere? (21% , 78% , 50%)

Q6/A/ How are Aluminum ions tested in solution of Aluminum compounds? explain and write the chemical equation. (10 M.)

B/ Answer the following : (10 M.)

1. Write the physical properties for silicon.
2. What is the difference between weak electrolytic and strongly electrolytic solution?

2022 Second Role

Q1 : A : 5 gram copper sulfate is dissolved in 20g of pure water, calculate mass percentage of solute and solvent.

Solution : $m_T = m_1 + m_2 = 5 + 20 = 25$ g

Percentage of mass solute = $\frac{(m_1)}{(m_T)} \times 100\ \%$

Percentage of mass solute = $\frac{5}{25} \times 100\ \% = 20\ \%$

Percentage of mass solvent = $\frac{(m_2)}{(m_T)} \times 100\ \%$

Percentage of mass solvent = $\frac{20}{25} \times 100\ \% = 80\ \%$

Q1 : B : Complete the following statement ? (Choose two only)

1. Silicon Dioxide (Silica) it occurs in nature as Pure silica such as ---------- .

Ans : Quartz and flints .

2. ---------- are sulfuric acid salts . Ans : Sulfate .

3 . In the periodic table the elements that assemble the right of periodic table are ---------- .

Ans : Block p

Q2 : A : Write briefly about ? (Choose three only)

A saturated solution: is the solution which contains a greater amount of the solute and the solvent can dissolve no more of solute at the given temperature and pressure.

Hydrocarbons: It contains only carbon and hydrogen only , either saturated or unsaturated .

Define water glass : The concentrated aqueous solution of sodium silicate.

Thermite process: It is an interaction produced when burning a mixture of aluminum and iron oxide (III) . The reaction is so vigorous with a great amount of heat ,shiny flame and a lot of sparks. This reaction results in molten iron, as aluminum reduces iron oxide (III).

Q2 : B : Write Lewis symbol for each the following : $_5B$, $_{14}Si$

Solution

$_5$B $1s^2\ 2s^2\ 2p^1$. $\dot{B}$.

$_{14}$Si $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^2$. $\dot{S}i$.

Q3 : A : Arrange the element by decreasing in their atomic size : $_2He$, $_{10}Ne$, $_{18}Ar$

Solution: $_2He$ $1s^2$

$_{10}Ne$ $1s^2\ 2s^2\ 2p^6$

$_{18}Ar$ $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6$

follow $_{18}Ar > {}_{10}Ne > {}_2He$

decreasing radius

All elements are from the same group. group (8) In one group the volume decreasing with the atomic number decreasing

Q3 : B : Explain the reason of the following ? (Choose two only)

1. Sliced Sodium loses its shining after some time.

Ans : Because of its combination with oxygen the wet atmosphere and its composition is a white layer.

2. Pure acid after leaving for a period of time is yellow

Ans : Because containing soluble nitrogen oxides (especially NO_2).

3. Silica gel is mainly used as a drier ?

Ans : Due to its large surface and great ability to absorb water

Q4 : A : Answer the following :

1. What are the feature of organic compounds in general ?

Ans: ❶ All organic compounds contain carbon in their compositions and are subject to decomposition or combustion by heating , particularly if heated to high temperature.

❷ Atoms in the organic compounds are bonded by covalent bonds, making them react slowly

❸ Many organic compounds do not dissolve in water but soluble in some organic liquids such as alcohol, ether, acetone and carbon tetrachloride .

2. Write uses alum ?

Ans :

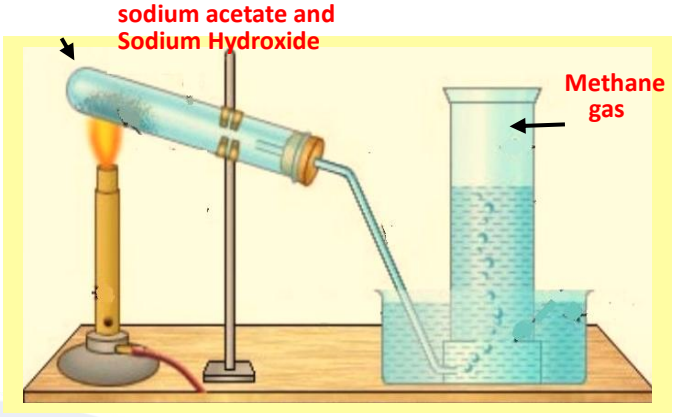
1 . As a sterile minor cuts. Where by it helps blood to clot easily .
2 . Make dye permanent on textiles .
3 . In purifying drinking water.

Q4 :B : Write the following reaction : (Choose two only)

1. $H_2S + CuSO_4$ Ans : $2HCl + CuSO_4 \longrightarrow H_2SO_4 + CuS\downarrow$
2. $Na + HCl$ Ans : $2Na + 2HCl \longrightarrow 2NaCl + H_2\uparrow$
3. $NH_4Cl + Ca(OH)\_2$ Ans : $2NH_4Cl + Ca(OH)_2 \longrightarrow CaCl_2 + 2H_2O + 2NH_3$

Q5 : A : How can be produced Methane gas in Laboratory ?
Draw shape of equipment and write the reaction ?

Ans: Methane is prepared whereby sodium acetates is heated at high temperature along with sodium hydroxide or calcium hydroxide (because the mixture will have little effect on glass and ensures higher melting point for sodium hydroxide) in a test tube , the resulting gas is collected by removing the water further down.



$$CH_3COONa + NaOH \xrightarrow{\Delta} CH_4\uparrow + Na_2CO_3$$

sodium acetate — Sodium Hydroxide — Methane — sodium Carbonate

Q5 : B : Choose the correct answer : (Choose two only)

1. Which one of the first group elements ? (Sodium , Radium , Boron) . **Ans : Sodium**
2. Sulfur element occurs in nature in the form (only free , only combined , free and combined) .
   Ans : Free and combined .
3. Which one of the following percentage of nitrogen in earth's atmosphere? (21% , 78% , 50%)
   Ans : (78%) .

Q6: A : How are Aluminum ions tested in solution of aluminum compound ? Explain and write the chemical reaction .

Ans: Aluminum ion is identified in its compounds by basic solution such as sodium hydroxide or potassium hydroxide whereby they react with aluminum ion (Al^{+3}) to form a white gelatin deposit which is aluminum hydroxide $Al(OH)_3$ as in the following formula:

$$Al^{+3} + 3NaOH \longrightarrow Al(OH)_3\downarrow + 3Na^+$$

aluminum ion — sodium hydroxide — aluminum hydroxide — sodium ion

Q6 : B : Answer the following :

1. Write the physical properties of silicon?
   1. Silicon is a metalloid.
   2. It is a very rigid element, with a high melting point of approximately (1410 °C).
   3. It has a gray color and a metallic luster.
   4. It is a semi-conductor. Due to this property.

2 What is the different between weak electrolytic and strongly electrolytic solution?

Strong electrolytic	Weak electrolyte
Its molecules are completely ionized in the solution تتأين جزيئاته بشكل تام مثل حامض الهيدروكلوريك	Its molecules are partially, moderately or slightly ionized جزيئاته غير تامة أو معتدلة أو قليلة التأين مثل حامض الهيدروفلوريك
like hydrochloric acid $HCl \rightarrow H^+ + Cl^-$	like hydrofluoric acid $HF \rightarrow H^+ + F^-$

Republic of Iraq - Ministry of Education

Examination in Chemistry for Intermediate Schools

(First Trial) June : 2023

Time : 3 Hours

Note: Answer (five questions) only, (20 Marks for each question).

Q1) A/ How can acetylene gas be produced in Laboratory? Draw shape of equipments and write the reactions. (12 M.)

B/ Mark the following sentences as (True) if they are write or (False) if they are wrong, after that correct the wrong sentences. (Choose Two Only) (8 M.)

1. The number of orbital of (F) sublevel is (5) orbitals.
2. The Solubility of the sugar in hot water is faster than cold water.
3. Elements of group IIA are called alkaline metals.

Q2) A/ Answer the following questions for Sodium atom $_{11}Na$? (10 M.)

1. Write electron configuration.
2. How many secondary energy level filled with electrons?
3. Write Lewis symbol for this atom.
4. What is the number of single electrons?
5. Find out period and group.

B/ Answer the following : (10 M.)

1. Write the physical properties for sulfur.
2. Write uses of Alum.

Q3)A/ A sample of vinegar contains (12%) of acetic acid by mass How many grams of vinegar is required to obtain (36g) of acetic acid ? (10 M.)

B/ Choose the correct answer : (Two Only) (10 M.)

1. Silica it occurs in nature as pure silica such as (quartz , sand , clay)
2. The discovery of the nucleus of the element is attributed to the scientist (Rutherford , Bor , Thomson)
3. All organic compounds contain one of the following elements in their composition (carbon , nitrogen , sulfur)

Q4)A/ Write briefly about: (Choose three only) (12 M.)

Sulfates , Ionization energy , Hydrolysis , solubility

B/ Write the differences between Methane and Ethylene by ? (8 M.)

1) Color 2) Solubility in water 3) Reaction with red bromine solution .

Q5)A/ How are ammonia gas Tested explain and write chemical equation? (12 M.)

B/ Write the following reaction ? (Choose Two Only) (8 M.)

1) $Na + MgO \longrightarrow$

2) $SiF_4 + K \longrightarrow$

3) $Al^{+3} + NaOH \longrightarrow$

Q6)A/ Explain the reason of following ? (Choose Two Only) (8 M.)

1. Aluminum does not reacts with both concentrated and dilute nitric acid continually .
2. When granules NaOH are Left in wet atmosphere they first fade and form a hard shell?
3. Silicon used in manufacturing solar cell which convert the solar energy into electricity.

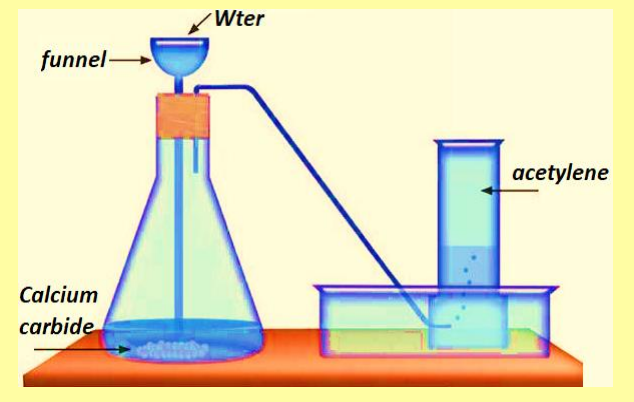
B/ Answer the following ? (12 M.)

1. What are the General properties of (VI A) group?
2. Write main forms of silicon .

2023 First Trail

Q1 :A : How can be produced acetylene gas in Laboratory ?

Draw shape of equipment and write the reaction ?



Acetylene can be produced by the reaction of calcium carbide, CaC_2 with water.

In the laboratory, acetylene can be produce by putting calcium carbide in an Erlenmeyer flask. Water is added very slowly and gradually using a tube.

The reaction which happens immediately produces the gaseous acetylene which can be collected from the bottle by removing water downward. $CaC_2 + 2H_2O \rightarrow C_2H_2\uparrow + Ca(OH)_2$

Q1 : B : Mark the following sentences as ($True$) if they write or ($False$) if they wrong and then correct the wrong sentences ? " Choose two only "

1. The number of orbital F sublevel is 5 orbital . Ans : False (F) . The correct (7 orbital)
2. The solubility of sugar in the hot water faster than that in the cold water . Ans : True T
3. Elements of group IIA are called alkaline metals .

   Ans : False (F) The correct " alkaline earth metals"

Q2 : A : Answer the following question for sodium atom $_{11}Na$?

1 . Write electron configuration at them .

2 . How many secondary energy level that are filled with electrons .

3 . Writ Lewis symbol for this atom .

4 . What is the number of single electrons .

5 . Find out Period and group .

Solution :

1. $_{11}Na$ $1s^2\ 2s^2\ 2p^6\ 3s^1$
2. Three 1s , 2s , 2p
3. Lewis structure . Na
4. 1 electron in 3s
5. group (1) , 3 rd period

Q2 : B : Answer the following :

1 Write the Physical Properties of Sulfur ?

1. It is yellow solid substance at STP.
2. Tasteless, with distinctive odor.
3. Insoluble in water, yet dissolves in some inorganic solvents like CS_2 carbon disulfide.
4. Non-conductor of electricity.
5. Has various forms in nature with variant physical properties.

2 Write the alum uses .

Ans :

1 . As a sterile minor cuts. Where by it helps blood to clot easily .
2 . Make dye permanent on textiles .
3 . In purifying drinking water.

Q3 : A : A sample of vinegar contains 12% of acetic acid by mass. How many grams of vinegar is required to obtain 36_g of acetic acids ?

Solution

Percentage mass of solute = $\frac{m_1}{m_T}$ x 100 %

12 % = $\frac{36}{m_T}$ x 100 %

$m_T = \frac{3600}{12}$

m_T = 300 g vinegar need

Q3 : B : Choose the correct answer : (Two only)

1. Silica it occurs in nature as Pure silica such as (quartz , sand , clay) . Ans : quartz .

2. The discovery of nucleus one of the element is attributed to the scientist : (Rutherford , Bor , Thomson) . Ans : Bor .

3. All organic compounds contain one of the following elements in their compositions . (carbon , nitrogen , sulfur) . Ans (carbon)

Q4 : A : Write briefly about : (Choose three only)

Sulfates: Sulfates are sulfuric acid salts which are derived from the reaction of sulfuric acid with the metals or with their oxides, hydroxides or carbonates .

Ionization Energy : The amount of energy required to remove one electron from the outer energy level of a gaseous atom .

Hydrolysis: its process of absorbing water from air being wet like table salt .

Solubility: is the maximum amount of a solute which can be dissolved in a given amount of a specific solvent to result in a saturated solution at a given temperature.

Q4 : B : Write the difference between methane and ethylene by ?

1. Color . 2. Solubility in water . 3. Reaction with red bromine solution .

Property	Methane	Ethylene
1 Color	Colorless	colorless
2 Solubility in water	Highly insoluble in water	insoluble in water
3 Reaction with red bromine solution	not react with the red bromine solution .	reacts with the red bromine solution and remove its color.

Q5 : A : How are Ammonia gas tested explain and write chemical equation ?

Ans : Ammonia can be detected as following : when ammonia react with hydrogen chloride , it produce white dense vapor which is ammonium chloride.

$$NH_3 + HCl \xrightarrow{\Delta} NH_4Cl \uparrow$$

Q5 : B : Write the following reaction ? (Choose two only)

1. $Na + MgO$ **Ans :** $2Na + MgO \longrightarrow Na_2O + Mg$

2. $SiF_4 + K$ **Ans :** $SiF_4 + 4K \longrightarrow Si + 4KF$

3. $Al^{+3} + NaOH$ **Ans :** $Al^{+3} + 3NaOH \longrightarrow Al(OH)_3\downarrow + 3Na^+$

Q6 : A : Explain the reason of the following ? (Choose two only)

1. Aluminum dose not reaction with both concentrated and dilute nitric acid continually .

Ans : Because aluminum oxide Al_2O_3 form a layer which isolates the acid from the metal therefore the reaction stops .

2. When granules NaOH are left wet atmosphere they first fade and then form a hard shell .

Ans : The hydrate layer of $NaOH$ reacts with CO_2 in air to form a layer of sodium carbonates Na_2CO_3 is which insoluble in concentrated NaOH solution.

3. Silicon used in manufacturing solar cells which convert the solar energy into electricity.

Ans : Because it is a semi-conductor.

Q6 : B : Answer the following ? **1 What are the General properties of Group VIA ?**

Ans: 1. Elements of this group are characterized by gradual increase in their atomic numbers , where by oxygen and sulfur are considered as non-metal.

Selenium and tellurium have non metalic properties . Polonium, it has pure metal properties.

2. All elements of the group VIA has six electrons in the outer shell .All elements "hunt" two electrons from other elements in order to have a stable electron configuration similar to that of noble elements.

2 What are the forms of silicon?

1. The first form is crystallized of dark brown color.

2. The second form is non-crystallized of dark gray color.

Republic of Iraq - Ministry of Education *(Second Trial) : 2023*

Examination in Chemistry for Intermediate Schools *Time : 3 Hours*

Note: Answer (five questions) only, (20 Marks for each question).

Note : Answer Five question.

Q1)A/ How can be produced Nitric acid in Laboratory? draw shape of equipments and write the reactions ? (12 M.)

B/ Mark the following sentences as (True) if they are write or (False) if they are wrong , and then correct the wrong sentences . (Choose Two Only) (8 M.)

1. Methane gas does not react with red bromine water.
2. Sulfuric acid can be industrially manufactured by contact process.
3. We convert concentrated solution to dilute solution by added solute

Q2)A/ Answer the following questions for chloride atom $_{17}Cl$: (10 M.)

1. Write electron configuration .
2. How many secondary energy Level filled with electrons?
3. Write Lewis symbol for this atom.
4. What is the number of single electrons?
5. Find out period and group.

B/ Answer the following: (10 M.)

1. Write the physical properties for Aluminum.
2. Write uses of sodium Hydroxide.

Q3)A/ What is the mass ratio of the solute and the solvent of a solution made of (50 g) salt dissolved in (150 g) of water? (12 M.)

B/ Choose the correct answer ? (Two Only) (8 M.)

1. The bond between two carbon atoms in the saturated hydrocarbons is (single , double , Triple)
2. The third main energy level contains a number of orbitals (4 , 9 , 16).
3. Sodium is preserved in liquid with which it does not react like: (kerosene , water , Nitric acid)

Q4)A/ Write briefly about : (Choose Three Only) (12 M.)

Aufbau principle , Hydrocarbons , Water glass , Solution .

B/ Write the differences between Duralumin and Aluminum Bronze alloy by : The percentage of elements , Characteristics . (8 M.)

Q5)A/ How are Aluminum ions tested in solution of Aluminum compounds explain and write the chemical equation ? (10 M.)

B/ Complete the following reactions then balance them. (Choose Two Only) (10 M.)

1) $FeS + H_2SO_4 \longrightarrow$

2) $Si + Cl_2 \longrightarrow$

3) $CH_4 + O_2 \xrightarrow{\Delta}$

Q6)A/ Explain the reason of following : (Choose Two Only) (8 M.)

1. Carbon dioxide when exposed to lime water becomes impure.
2. Noble gases have the greatest Ionization energy.
3. Silica Jel used as a drier factor.

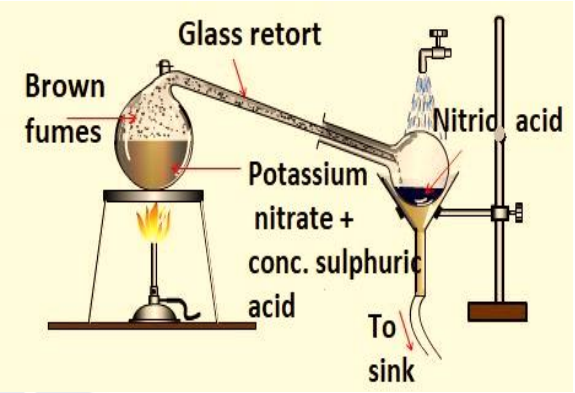
B/ Answer the following ? (12 M.)

1. Why Put the elements ($_3Li$) and ($_{11}Na$) within the same group although different in the atomic number?
2. Explain with writing chemical equation how to prepare sulfur dioxide gas Industrially ?

2023 second trail

Q1 :A : How can be produced Nitric acid in Laboratory ?

Draw shape of equipment and write the reaction ?



Ans : This acid is usually prepared by heating a mixture of Potassium nitrate salt with sulfuric acid in the glass retort, and the nitric acid vapor resulting from the interaction is condensed in a water-cooled vessel .

as the following equation:

$$KNO_3 + H_2SO_4 \longrightarrow KHSO_4 + HNO_3$$

Q1 : B : Mark the following sentences as ($True$) if they write or ($False$) if they wrong and then correct the wrong sentences ? " Choose two only "

1. **Methane gas does not react with the red bromine water. " true "**
2. **Sulfuric acid can be industrially manufactured by contact process. " true" .**
3. **We convert concentrated solution to dilute solution by added solute .**

Ans : Wrong " by added solvent" .

Q2 : A : Answer the following questions for chlorin atom $_{17}Cl$:

1 . Write electron configuration. 2 . How many secondary energy levels filled with electrons.
3 . Show Lewis symbol for this atom. 4 . What is the number of single electrons ?
5 . Find out period and group .

solution

1. $_{17}Cl$ $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^5$
2. four 1s, 2s , 2p , 3s
3. Lewis structure $:\ddot{Cl}:$
4. 1 electron in 3p .
5. group 7 , 3 rd period

Q2 : B : Answer the following : 1. Write the physical properties of the aluminum.

a. Aluminum is a fine silvery metal with a remarkable . b. low density.

c. it is a good conductor for heat and electricity.

2. Write uses of sodium hydroxide.

a. It is used in many industrial fields such as soap and detergent industries, textile, and paper manufacturing.

b. It is used as an essential raw material in the preparation of many chemical compounds used in various industries.

Q3 : A : What is the mass ratio of the solute and the solvent of a solution made of 50 g of salt dissolved in 150 g of water .

Solution :

Mass of solute :15.3_g = m_1

Mass of solvent:155_g =m_2

$m_T = m_1 + m_2$ =50 +150 = 200 g

Mass ration of solute = $\frac{(m_1)}{(m_T)} \times 100\ \%$

Mass ration of solute = $\frac{50}{200} \times 100\ \% = 25\%$

Mass ration of solvent = $\frac{(m_2)}{(m_T)} \times 100\ \%$

Mass ration of solvent = $\frac{150}{200} \times 100\ \% = 75\ \%$

Q3 : B : Choose correct answer? (Two only)

1. The bond between two carbon atoms in the saturated hydrocarbons is

(Single , double , triple) Ans : Single .

2. The third main energy level contains a number of orbitals : (4 , 9 , 16) Ans : 9

3. Sodium is preserved in liquids with which it dose not react like :

(Kerosene , water , Nitric acid) . Ans : Kerosene .

Q4 : A : Write briefly about : (Choose three only)

Aufbau Principle: This principle shows: "that secondary energy levels are filled with electrons according to their energy level, from the lowest to the highest".

Hydrocarbons: It contains only carbon and hydrogen only , either saturated or unsaturated .

Water glass : The concentrated aqueous solution of sodium silicate.

Solutions: It is homogeneous mixtures composed of two or more pure substance having no chemical reaction between them. the substance with majority in the solution is called the (solvent) and the material with less existence in the solution is called the solute.

Q4 : B : Write difference between duralumin and aluminum bronze by :
The percentage of elements , Characteristics.

Ans :

	Duralumin alloy	Aluminum Bronze
1	consists of high percentage of aluminum and a small amount ratio of copper and magnesium.	consists of a small percentage of aluminum and a high ratio of copper
2	light and hard	resistance to erosion
3	used for building aircraft part.	used to make decoration materials.

Q5 : A : How to Test of Aluminum Ions tested in solution of aluminum compounds explain and write chemical equation?

Ans: Aluminum ion is identified in its compounds by basic solution such as sodium hydroxide or potassium hydroxide whereby they react with aluminum ion (Al^{+3}) to form a white gelatin deposit which is aluminum hydroxide $Al(OH)_3$ as in the following formula:

$$Al^{+3} + 3NaOH \longrightarrow Al(OH)_3\downarrow + 3Na^+$$

aluminum ion — sodium hydroxide — aluminum hydroxide — sodium ion

Q5 : B : Complete the following reactions then balance them . (Choose two only)

1. $FeS + H_2SO_4$ — Ans : $FeS + H_2SO_4 \longrightarrow FeSO_4 + H_2S\uparrow$
2. $Si + Cl_2$ — Ans: $Si + 2Cl_2 \longrightarrow SiCl_4$
3. $CH_4 + O_2$ — Ans : $CH_4 + 2O_2 \xrightarrow{\Delta} CO_2 + 2H_2O$ + energy

Q6 : A : Explain the reason of the following : (Choose Two Only)

1. When carbon dioxide exposed to limewater becomes impure .

Ans : Because of calcium carbonate as in:

$$Ca(OH)_2 + CO_2 \longrightarrow CaCO_3\downarrow + H_2O$$

2. Noble gases Because have the greatest ionization energy .

Ans : Because do not lose electrons easily .

3. Silica gel is mainly used as drier factor .

Ans: Because its large surface and great ability to absorb water.

Q6 : B : Answer the following ?

1. Why put the elements ($_3$Li) and ($_{11}$Na) within the same group , although different in the atomic number .

Ans : Because they have the same number of electrons in their outer shells one electron .

2. Explain with writing the chemical equation how to prepare sulfur dioxide gas Industrially ?

Ans : By the combustion of sulfur in air. The molten sulfur is pumped in special combustion towers. The resultant gas contains some impurities which need to be removed.

$$S + O_2 \xrightarrow{\Delta} SO_2$$

Republic of Iraq - Ministry of Education ***(First Trial) June : 2024***

Examination in Chemistry for Intermediate Schools ***Time : 3 Hours***

Note: Answer (Five Questions) only, (20 Marks for each question) .

Q1/A) How can be produced chlorine gas in Laboratory ? Draw shape of equipment and write the reactions. (12 M.)

B) Mark the following Sentence as (True) if its right or (False) if its wrong , then correct the wrong sentence. (Choose Two Only) (8 M.)

1. Water glass used as a cheap adhesive .
2. Sodium used as an active reducing agent in some of the organic interaction because it burns when exposed to air.
3. Atoms in the organic compounds are bonded by covalent bonds making them react slowly.

Q2/A) Atom element ends with electronic Level $3S^1$, find out : (12 M.)

1. Electron configuration .
2. Atomic number of this element.
3. How many secondary energy level filled with electrons?
4. Write Lewis Symbol for this atom.
5. What is the number of single electrons?
6. Find out period and group.

B) Answer the following : (8 M.)

1. Write the most important properties of Silica.
2. Give example about cyclic organic compound in triangular shape.

Q3/ A) Mass percentage of sugar is (11.5 %) in Juice also Juice contain (85.2 g) sugar. What is the volume of Juice ? $\rho_{(solution)} = 1\ (g/mL)$ (12 M.)

B) Explain the reason of following: (Choose Two Only) (8 M.)

1. Benzene is the simplest compound in the group of hydrocarbons which are Called (Aromatic Hydrocarbons)
2. Triple super phosphate fertilizer is far much better than ordinary phosphate fertilizer.
3. Sulfuric acid are used in the Production of other acids such as nitric and Hydrochloric acid.

Q4/A) Write briefly about: (Choose Three Only) (12 M.)

Silicons / Inactivated Alcohol / Chemical Luminance / Electronegativity (8 M.)

B) Answer the following:

1. Write the difference between the Saturated Solution and Unsaturated Solution.
2. Write the physical properties for Sodium.

Q5/A) How are hydrogen sulfide gas tested explain and write chemical equation ? (12 M.)

B) Complete the following reactions then balance them. (Choose Two Only) (8 M.)

1. $Al + HCl \longrightarrow$
2. $Ca(OH)_2 + CO_2 \longrightarrow$
3. $C_2H_2 + O_2 \xrightarrow{\Delta}$ (12 M.)

Q6/A) Complete the following statement: (Choose Three Only)

1. The elements of group IIIA are metals except .....which metalloid.
2. Silicon is most abundant element in the earth's Crust it constitutes approximately.....
3. The top of matchsticks is covered by friction material like.....
4. The number of orbitals of (F) sublevel are..... (8 M.)

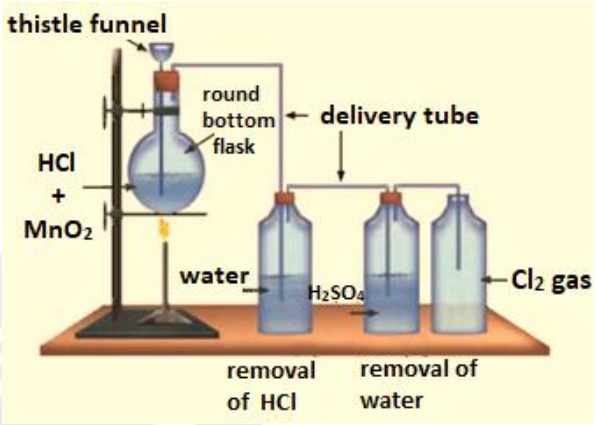
B) Explain the extraction of Aluminum and write the name of the method.

2024 first trail

Q1: A: How can be produced chlorine gas in laboratory? Draw shape of equipment and write the reaction?

Chlorine is prepared in laboratory by oxidizing concentrated hydrochloric acid with manganese (*IV*) dioxide as shown in the following equation:

$$4HCl + MnO_2 \xrightarrow{\Delta} MnCl_2 + 2H_2O + Cl_2\uparrow$$



The resulting gas is refined from HCl and water by passing it through bottles containing water and sulfuric acid consecutively.

It is observed that manganese (*IV*) dioxide does not act as a catalyst but it is consumed after the reaction as an oxidizing elements.

Q1 : B : Mark the following sentence as true if its right or false if its wrong then correct the false sentence ?

1. water glass used as a cheap adhesive. Ans : true .
2. Sodium used as an active reducing agent in some of organic interaction because it burns when exposed to air .

Ans : false . the correct :Aluminum used as an active reducing.

3. Atoms in the organic compounds are bonded by covalent bonds, making them react slowly.

Ans : true

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Q 2: A: Atom element ends with electronic level $3s^1$, find out :

1 . Electron configuration .

2 . Atomic number of this element .

3 . How many secondary energy level that are filled with electrons .

4 . Write Lewis symbol for this atom.

5 . What is the number of single electrons

6 . Find out period and group.

Ans :

1 . X: $1s^2\ 2s^2\ 2p^6\ 3s^1$

2. Atomic number equal : 11

3 . Two

$1s^2$	$2s^2$
↿⇂	↿⇂

4 . Lewis symbol is

$3s^1$
1

5 . *the number of single electrons are one only.*

6 . : group (1) , 3 rd period

Q2 : B : Answer of the following : 1. Write the most important properties of silica .

Ans : ❶ It is not reactive when reacts with chlorine, bromine, hydrogen or most of the acids.

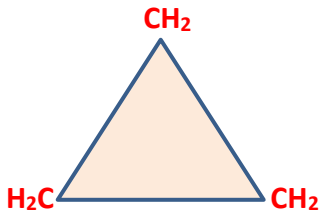
❷ It reacts with hydrofluoric acid and bases.

❸ It reacts with oxides or metal carbonates by high heating. The resultant compounds are known as (silicates).

❹ Silica gel is mainly used as a drier due to its large surface and great ability to absorb water

2. Give example about cyclic organic compound in triangular shape .

Ans :



Triangular shape

Q3 : A : ***Mass percentage of sugar is 11.5 % in juice also juice contain 85.2 gram sugar, what is the volume of juice? ($\rho_{solution}$ =1 g/ml)***

Solution :

Percentage of mass HCl = $\frac{sugar \quad m1}{Solution \quad mT} \times 100\ \%$

11.5 % = $\frac{85.2}{m_T} \times 100\ \%$

$m_T = \frac{85.2 \times 100}{11.5}$ = 740.87 g *juice*

$\rho\ (g/mL) = \frac{m\ (g)}{V\ (mL)}$

$1 = \frac{740.87}{V_{ml}}$

V_{ml}= 740.87 ml

Q3 : B : Explain the reason of following :

1.Benzene is the simplest compound in the group of hydrocarbons which are called " Aromatic Hydrocarbons"

Ans : Because of their distinctive smells.

2: Triple super-phosphate fertilizer is far much better than ordinary phosphate fertilizer ?

Ans : Because it doesn't contains calcium sulfate .

3 . Sulfuric acid are used in the production of other acids such as nitric and hydrochloric acid.

Ans : Because of its high boiling point.

Q4: A : Write briefly about : (Choose three only)

1. **Silicones :** Are organic compounds of silicon. They aren't poisonous and are very stable along a very wide range of temperature variation.
2. **Inactivated alcohol :** It is ethanol alcohol after adding poisonous substance like methyl alcohol are added to it , also, some dyeing substance are added to it to make its color different from pure ethyl alcohol.
3. **Chemical luminance** : The process of white phosphorus flare in the dark when exposed to humid air appears pale green and accompanied by the process of emitting an odor resembling garlic.
4. **Electronegativity** The tendency of an atom to attract bonded electrons towards itself in any chemical compound .

Q4 : B : Answer the following :

1 Write the difference between the saturated solution and unsaturated solution.

Super saturated	An unsaturated solution
A saturated solution: is the solution which contains a greater amount of the solute and the solvent can dissolve no more of solute at the given temperature and pressure.	contain less amount of the solute that is required for saturation at a particular temperature and pressure .

2 Write the physical properties for sodium?

1. Sodium is a soft metal.
2. has a bright silvery luster when it is readily cut.
3. Its density is less than the density of water.
4. It melts down at (97.81C^{o}).
5. Molten sodium boils at (882.9°C).

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Q5 : A : How are hydrogen sulfide gas tested explain and writ chemical equation ?

Ans : Passing hydrogen sulfide gas through in the solutions of metal ions like copper sulfuric results a black precipitation of copper II sulfide according to the following equation:

$$\underset{\text{hydrogen sulfide}}{H_2S} + \underset{\text{copper (II) sulfate}}{CuSO_4} \longrightarrow \underset{\text{sulfuric acid}}{H_2SO_4} + \underset{\text{copper (II) sulfide}}{CuS\downarrow}$$

Q5 : B : Complete the following reactions then balance them :

1. $Al + HCl$
2. $Ca(OH)_2 + CO_2$
3. $C_2H_2 + O_2$

Ans :

1. $2Al + 6HCl \longrightarrow 2AlCl_3 + 3H_2$
2. $Ca(OH)_2 + CO_2 \longrightarrow CaCO_3\downarrow + H_2O$
3. $2C_2H_2 + 5O_2 \longrightarrow 4CO_2 + 2H_2O$

Q6: A: Complete the following statement: (Choose three only)

1. The elements of group $IIIA$ are metals except ---------- which metalloid. **Ans :** boron.

2. Silicon is the most abundant element in the earth's crust it constitutes approximately ---------.

Ans : 28%.

3. The top of a paste matchstick is covered by friction material like ----------. **Ans:** glass powder

4. The number of orbitals (F) sublevel are --------- . **Ans : 7**

Q5 : B : Explain the extraction of Aluminum and write the name of the method .

Ans : The name of method " **Frasch Process**"

Sulfur is extracted freely in the form of underground deposits by using **Frasch Process**.
This process is done by

1. Melting sulfur underground by means of special equipment, consisting of three overlapping tubes pivotally centered , as follows :
2. Pressurized and superheated to **170°C** water vapor is pushed into the outer tube (A) to where sulfur converges, this pressure melts sulfur underground.
3. Pressurized air from tube B lifts up molten sulfur through tube C, the middle tube. Sulfur comes out to the surface from this tube mixed with some air bubbles
4. On the surface, molten sulfur is cast in large basins and left to cool down and solidify
5. Much of the sulfur produced **99.5%-99.9%** pure, therefore in needs no further re purification.

Examination in Chemistry for Intermediate Schools — *Time : 3 Hours*

الكيمياء الدور الثاني
المتميزين 2024

Note: Answer (Five Questions) only, (20 Marks for each question) .

Q1/A) An atom , the electrons of which are ordered as follows : $1S^2\ 2S^2\ 2P^4$ (12 M.)

1) What is the atomic number?
2) How many secondary energy level filled with electrons?
3) What is the number of single electrons?
4) Write Lewis symbol for this atom.

B) Compare between Aluminum and iron oxidation reactions that effected by Air. (8 M.)

Q2/A) Calculate the percentage of volume for both acetic acid and water in a solution formed by mixing (15 ml) of acetic acid and (35 ml) of water. (10 M.)

B) Choose the most appropriate of the of the brackets that complete the following expressions: (10 M.)
(Answer Five Only)

1. Sulfur element occurs, in nature, in form: (Free only , Combined only , Free and combined).
2. Which one of following gas is used to bleach herbal colors? (Chlorine , Hydrogen , Nitrogen).
3. The bond covalent between two carbon atoms in the saturated hydrocarbons is a: (Single , Double , Triple).
4. Which answer is true example for solid solution in another solution? (Juice , Coin , Salt solution)
5. Calcium compounds give the flame of Benzene Lamp color: (Scarlet , Yellowish green , Dark red).
6. What is the role of Aluminum for Thermite reaction? (Catalysis , Reducing agent , Oxidizing agent).

Q3/A) The top of matchsticks is covered by a paste made of materials. What are these materials? (8 M.)

B) Give a reason for each of the following: (Choose Three Only) (12 M.)

1. Use of silicon in manufacturing of electrical devices and applications and also in computer industry.
2. Rutherford's model is called the planetary astral model.
3. Elements of groups IA and IIA they can not occur in the free form in nature.
4. Sulfur dioxide gas is collected by pumping air out from above in the laboratory.

Q4/A) Complete the following reactions then balance them : (Choose Two Only) (10 M.)

1. $NaCl \xrightarrow{\text{electric current}}$
2. $S + Fe \xrightarrow{\Delta}$
3. $CaO + H_2O \longrightarrow$

B) What is meant by water glass? what are it's uses? (10 M.)

Q5/A) Define (Two) of the following : Potassium alum , Chlorides , Solubility (10 M.)

B) How is ammonia detected? Support your answer with a balanced chemical equation. (10 M.)

Q6/A) How can be produced Methane gas in laboratory? Draw shape of equipment and write the balanced chemical equation. (12 M.)

B) Complete the following: (Choose Two Only) (4 M.)

1. There are two types of silicon dioxide (Silica) in nature, first one pure as ..... and non-pure type such as ..... .
2. The underground deposits of sulfur is extracted in the Mishraq fields, according to ..... .
3. Aluminum reacts with both of acids and bases to release ..... gas.

C) Answer (one) of the following: (4 M.)

1. What are positions of the elements blocks in the periodic table?
2. What is the difference between normal plaster and Paris plaster?

2024 second trail

Q1 : A: In atom, the electrons of which are ordered as follows. $1s^2\ 2s^2\ 2p^4$

1- What is the atomic number ?
2- How many secondary energy level filled with electrons?
3- What is the number of single electron?
4- Write Lewis symbol for this atom?

Solution

1 . The atomic number is" 8 " because it equals to the number of electrons.

2 . The number of secondary levels filled with electrons is only two.

3 . It is noted that the number of single electrons are two only.

4 . Lewis symbol is  symbol

Q1: B : Compare between aluminum and iron oxidation reaction that effected by air

Ans : Aluminum and it's alloy have a very high mass , when exposed aluminum to air, it forms a thin but firm layer of aluminum oxide which sticks to the metal with " self-protection" against erosion.

While , when exposed iron to air, it forms a thin layer of iron oxide erosion is very thin and fragile, it lets air , oxygen and humidity penetrate the metal.

Therefore , the erosion continues.

Q2: A : ***Calculate the percentage of volume for both acetic acid and water in a solution formed by mixing 15 ml of acetic acid and 35 ml of water.***

Solution : Volume of the solute $V_1 = 15$ ml

Volume of solvent $V_2 = 35$ ml

Volume of the solution $(V_1 + V_2) = 15 + 35 = 50$ ml

Percentage of volume of the acetic acid $= \frac{v_1}{VT} \times 100\ \%$

Percentage of volume of the acetic acid $= \frac{15\ ml}{50\ ml} \times 100\ \% = 30\ \%$

Percentage of volume of the water $= \frac{v_1}{VT} \times 100\ \%$

Percentage of volume of the water $= \frac{35\ ml}{50\ ml} \times 100\ \% = 70\ \%$

Q2: B : Choose the most appropriate of the brackets that complete the following expressions:

1. Sulfur element occurs in nature in the form (free – combined – free and combined).

   Ans : Free and combined .

2. Which one of following gas is used to bleach herbal colors? (Chlorine , Hydrogen , Nitrogen)

   Ans : Chlorine .

3. The bond covalent between two carbon atoms in the saturated hydrocarbons is a :

   (single , double , triple) .

   Ans : Single .

Q3 : A : The top matchstick is covered by the past made of materials . What are these materials ?

Ans :

a . Flammable material like antimony sulfide Sb_2S_3.

b . An oxidant, like Potassium Chlorate $KClO_3$.

c . Friction material like glass powder.

d. Glue material to bind the ingredients of the paste .

Q3 : B : Give a reason for each of the following :

1. Use of silicon manufacturing of electrical devices and applications and also in computer industry.

Ans : Because it is a semi-conductor.

2. Rutherford's model called the planetary model?

Ans: Because electrons rotate around the nucleus in various orbits with varying distances from the nucleus as is the case of planets rotating around the sun.

3. Elements of groups IA and IIA they can not occur in the nature.

Ans: Because of their reactivity, they cannot occur in the free form in nature.

4. Sulfur dioxide gas is collected by pumping air out from above in the laboratory.

Ans : Because it is heavier than air.

Q4 : A : Complete the following reactions then balance them :

1. $NaCl$
2. $S + F$
3. $CaO + H_2O$

Ans :

1. $2NaCl \xrightarrow{Electric\ current} \underset{\text{Negative pole}}{2Na} + \underset{\text{positive pole}}{Cl_2}\uparrow$

2. $S + Fe \xrightarrow{\Delta} FeS$

3. $CaO + H_2O \longrightarrow Ca(OH)_2$

Q4 : B : What in meant by water glass ? What is uses ?

Ans : Water glass : The concentrated aqueous solution of sodium silicate.

It is commonly used in various industrial fields such as :

1 . Providing passive fire protection for textiles and papers.

2 . It is used as a cheap adhesive.

3 . Cement can be strengthened by mixing it with sodium silicate in order to be used in buildings.

****

Q5 : A : Define :

1. **Potassium alum :** Is a double salt of aluminum sulfate, potassium sulfate and crystalline water molecules with a fixed mass. The general formula $KAl(SO_4)_2.12H_2O$.
2. **Chlorides** are salts of hydrochloric acid. They are formed when a metal or root such as ammonium replaces the hydrogen in the acid.
3. **Solubility:** is the maximum amount of a solute which can be dissolved in a given amount of a specific solvent to result in a saturated solution at a given temperature.

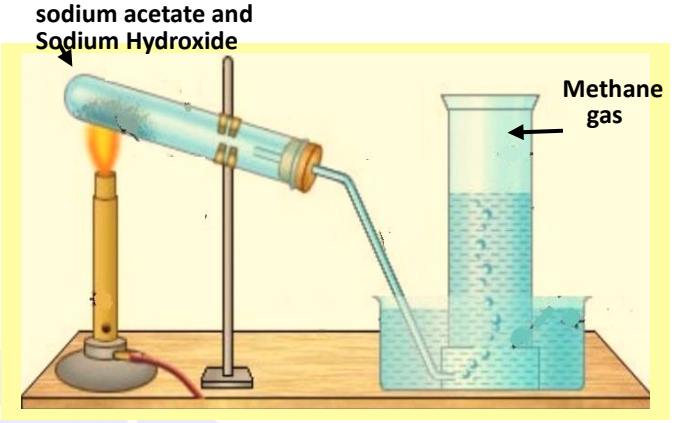
Q5 : B : How is Ammonia detected ? Support your answer with balanced chemical equation.?

Ans : Ammonia can be detected as following : when ammonia react with hydrogen chloride , it produce white dense vapor which is ammonium chloride.

$NH_3 + HCl \longrightarrow NH_4Cl\uparrow$

Q6 : A : How can be produced Methane gas in laboratory ? Draw shape of equipment and write the reaction?

Ans: Methane is prepared whereby sodium acetates is heated at high temperature along with sodium hydroxide or calcium hydroxide (because the mixture will have little effect on glass and ensures higher melting point for sodium hydroxide) in a test tube , the resulting gas is collected by removing the water further down.



$$CH_3COONa + NaOH \xrightarrow{\Delta} CH_4\uparrow + Na_2CO_3$$

sodium acetate Sodium Hydroxide Methane sodium Carbonate

Q6 : B : Complete the following :

1. Ther are two types of silicon dioxide (silica) in nature , first one pure as --------- and non-pure type such as --------- .

   Ans : such as quartz and flints , sand and clay.

2. The underground deposits of sulfur is extracted in the Mishraq fields , according to -------.

   Ans : Frasch Process.

3. Reaction of aluminum reacts with both of acids and bases to release ---------- gas .

   Ans : Hydrogen

Q6 : C : Answer (one) of the following :

1. What are positions of the elements blocks in the periodic table?

Ans : s -Block Elements They are elements on the far left of the periodic table .

p-Block Elements :These elements are located on the right side of the periodic table.

d-Block Elements :They are located at the centre of the periodic table .

f-Block Elements :These elements are located at the bottom of the periodic table .

2. What is the difference between normal plaster and Paris plaster.

Ans :

Paris plaster	Normal plaster
1- One molecule contains one water molecules $(CaSO_4)_2 . H_2O$	1- One molecule contains two water molecules $CaSO_4 . 2H_2O$
2- when it a gets a water molecule that turns in to normal plaster.	2- when losses one molecule of water it turns into Paris plaster $Ca(SO_4)_2 . H_2O$.