Science

Prep.3

Second Term 2024

February Revision

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Unit One

*** طبقاً لأخر تعديل في المادة للعام الدراسي 2023-2024**

February Revision

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(1) Write the scientific term:

1) A chemical process through which the atom loses one electron or more. (.....)

2) A chemical process which decreases oxygen percentage in the substance (.....)

3) The change in the concentration of the reactants and the products in a unit time. (.....)

4) The enzyme which is found in sweet potato and accelerates the decomposition rate of hydrogen peroxide (.....)

5) The metallic can exists in most modern cars to treat the harmful gases emitted from the engine. (.....)

6) A substance which changes the rate of chemical reaction without being changed. (.....)

7) They are chemical substance produced by the body of living organism act as catalysts that increase the speed of biological reactions. (.....)

8) The breaking up of bonds in reactants molecules and formation of a new bonds in the products molecules in the reaction. (.....)

9) The reaction between an acid and an alkali to give salt and water (.....)

10) Chemical reactions in which an element substitutes another one. (.....)

11) A chemical process which increase oxygen percentage in the substance. (.....)

12) Chemical reactions in which a catalyst speeds up their rate. (.....)

13) It is a reaction where double substitution occurs between the ions of two compounds to form two new compounds. (.....)

14) The substance which loses one or more electrons in a chemical reaction. (.....)

15) Chemical compound which is resulted from the reaction of acid with alkali. (.....)

16) The change in the concentration of the reactants and resultants at a unit time. (.....)

17) A chemical process in which the atom loses an electron or more. (.....)

18) The breaking up of bonds in reactant molecules and the formation of new bonds in the products molecules. (.....)

19) The material which increases the speed of reaction without being changed. (.....)

✹(2) Choose the right answer:

1.The reaction of oil with caustic soda is one of the ..... reactions.

a. very fast b. relatively slow c. very slow

2.On heating red mercuric oxide, it decomposes into .....

a. oxygen. b. mercury. c. oxygen and mercury. d. no correct answer.

3.At the beginning of the reaction the percentage of the reactants concentration equal

a. 100% b.0% c. 50% d. no correct answer

4.By adding silver nitrate solution to sodium chloride solution, a ..... precipitate is formed

a. black b. white c. blue d. brown

5.At the end of the chemical reaction, the concentration of the reactants is .....

a. zero % b. 25% c. 50% d. 100%

6.The substance which change the rate of the reaction without being changed is known as .....

a. oxidizing agent. b. active agent. c. catalyst. d. reducing agent.

7.All the following elements replace hydrogen of the diluted acid except .....

a. Al b. Zn c. Au d. Sn

8.When magnesium replaces copper in a solution of one of its salts, a ..... precipitate is formed.

a. black b. green c. red d. blue

9.Oxidization is a chemical process which increases ..... percentage in substance.

a. hydrogen b. oxygen c. helium d. fluorine

10.A reaction between an acid and an alkali to from salt and water is known ..... reaction.

a. reduction b. neutralization c. simple substitution

11.Sodium replaces the following metals in their salt solutions except for .....

a. copper. b. potassium. c. magnesium. d. zinc.

12.Sweet potato includes oxidase enzyme which helps in decomposition of ..... faster.

a. hydrogen chloride b. sodium chloride
c. hydrogen peroxide d. sodium carbonate

13.Air bag contains sodium .....

a. sulphate. b. azid. c. oxide. d. carbonate

14.When hydrochloric acid reacts with sodium carbonate, then the reaction produces gas which .....

a. turbid limewater. b. bums with a pop sound.
c. increases ignition. d. its colour is red brown.

15.Magnesium element is considered more active than .....element.

a. calcium b. potassium c. zinc d. sodium

16.When a sodium atom loses an electron from its outer most energy level so it .....

a. oxidized only. b. reduced only.

c. becomes reducing agent only. d. oxidized and becomes reducing agent.

17.The reaction : $Cl_2 + 2e^- \rightarrow 2Cl^-$, represent .....process.

a. oxidation b. reduction c. decomposition d. substitution

18.In adding silver nitrate solution to sodium chloride solution, ...precipitation is formed from silver chloride.

a. red b. blue c. black d. white

19.The most active metal in the chemical activity series is .....

a. copper. b. sodium. c. hydrogen. d. aluminum.

20.Thermal decomposition of copper carbonate gives .....

a. copper+ water. b. copper+ carbon dioxide.

c. copper oxide+ carbon dioxide. d. copper oxide+ water vapor.

21.White sodium nitrates decompose by heat into ..... and oxygen.

a. sodium nitrite b. nitrogen c. sodium oxide d. ammonia

22.The reaction of oil with caustic soda is considered as reaction .....

a. relatively fast. b. relatively slower.

c. takes several months. d. takes several years.

23.Clear lime water turbid on passing ..... gas through it.

a. nitrogen dioxide b. suphur dioxide

c. carbon dioxide d. (a and b) are correct

24.The neutralization reaction occurs between .....

a. metal and non-metal. b. acid and salt.

c. copper and carbon. d. acid and alkali

25.When magnesium replaces copper in its salt solution, a ..... precipitate is formed.

a. black . b. red c. reddish brown

26.All the following metals replace hydrogen of acid except .....

a. potassium. b. magnesium. c. silver. d. zinc.

27.From compounds which are decomposed by heat into metal and oxygen is .....

a. $Cu(OH)_2$ b. $CaSO_4$ c. $CuCO_3$ d. HgO

28.Carbon dioxide evolves during thermal decomposition of ..... compound.

a. HgO b. $CuSO_4$ c. $CuCO_3$ d. $Cu(OH)_2$

29.substitution reactions between salt solutions are accompanied by formation of .....

a. metal. b. a precipitate. c. an oxide. d. a non-metal.

30.On adding silver nitrate solution to sodium chloride solution, ... is formed.

a. a white precipitate of sodium nitrate
b. a white precipitate of silver chloride
c. a blue precipitate of silver chloride
d. no precipitate

31.When hydrochloric acid reacts with sodium carbonate, then the reaction produces gas which .....

a. turbid limewater.
c. increases ignition.
b. burns with pop sound.
d. its color is red brown.

32.The reaction in which double substitution occurs between the ions of two compounds to form two other new compounds is called..... reaction.

a. double substitution
b. simple substitution
c. neutralization
d. oxidation and reduction

33.The rate of breaking up of hydrogen peroxide increases by the addition of .....

a. manganese oxide.
b. magnesium oxide.
c. manganese dioxide.

34.The speed of most chemical reactions is ..... by rising temperature.

a. increased b. decreased c. not affected

35.The reaction between silver nitrate and sodium chloride is from ..... reactions.

a. fast b. intermediate c. slow d. very slow

✹(3) Complete the following :

1. During ..... reaction, the compound is decomposed by heat into its simple components, and in the ..... reaction a metal substitutes another one in its salt solution.
2. Na_2CO_3 +..... → $2NaCl + H_2O + CO_2$
3. The reactions of covalent compounds are slower because they take place between .....
4. Sweet potato contains ..... enzyme which helps in decomposition of hydrogen peroxide.
5. Reaction between an acid and an alkali forms ..... and .....
6. During the chemical reaction, the concentration of reactants gradually ..... , whereas the concentration of products gradually .....
7. The speed of chemical reaction can be measured by the rate of appearance of one of ..... substances.
8. At the beginning of the chemical reaction the percentage of the reactants concentration equal ..... %
9. The breaking up of bonds in the molecules of reactants and the formation of new bonds in the molecules of product is called .....
10. The compound decomposes by heat into its simple components in .... reactions.
11. In the reaction of sodium with chlorine to form sodium chloride, ... is considered as an oxidizing agent, and ..... is considered as a reducing agent.
12. Nitrogen pentoxide breaks up into ..... gas and ..... gas.
13. The reaction of covalent compounds are ..... than of the ionic compounds.
14. Chemical reaction is ..... in the reactant molecules, and ..... in the products molecules.
15. Most metals ..... decompose to ..... and sulpher trioxide.
16. When magnesium replaces copper in its salt solution a precipitate its color is ..... is formed.
17. Neutralization it is the reaction between an acid and an alkali forming ..... and .....
18. During the chemical reaction, the concentration of ..... decreases, while the concentration of ..... increases by the time.

19. Carbon dioxide gas detected by changes ..... into turbid.

20. Sodium metal reacts with water producing sodium hydroxide and ..... gas evolves.

21. The speed of chemical reaction can be practically measured by the rate of..... of reactants or the rate of ..... of resultants.

✹(4) Correct the underlined words:

1	Most metal carbonates decompose by heat to metal oxide and **nitrogen** gas evolves.	……
2	**Oxidation** is a chemical process in which an atom gains one electron or more.	……
3	In **positive catalysts** reaction, catalyst is used to slow down the chemical reaction.	……
4	Rate of reaction of the dilute hydrochloric acid with iron filling is **slower** than that with the same mass of a piece of iron	……
5	**The iron rust** is a fast chemical reaction	……
6	Nitrogen pentoxide breaks up into nitrogen dioxide gas and **nitrogen** gas	……
7	The reactions of the covalent compounds are **fast**	……
8	On adding piece of magnesium to copper sulphate solution **black** precipitates is formed.	……
9	The ionic compounds are fast in their reactions, because they decompose into **molecules** that easily share in the reaction.	……
10	When we add silver nitrate solution to sodium chloride solution, a **black** precipitate is formed	……
11	Mercuric oxide is **silvery** color	……
12	Rate (speed) of chemical reaction is increased by **decreasing** the temperature.	……
13	The **catalyst** is the substance which loses one or more electrons during the chemical reaction.	……
14	**Oxygen** gas detected by changes limewater into turbid.	……

✹(5) Give reason for:

1. Copper doesn't react with dilute hydrochloric acid whereas zinc reacts with it.

.....

2. The rate of chemical reaction increases by increasing concentration of reactants.

.....

3. A red precipitate is formed when magnesium is added to copper sulphate solution.

.....

4. The combustion of the steel scourers used for cleaning aluminium pots in a jar contains oxygen is faster than its combustion in the air.

.....

5. Adding a piece of sweet potato enhances the decomposition of the hydrogen peroxide.

.....

6. A white precipitate is formed on adding silver nitrate solution to sodium chloride solution.

.....

7. Diluted Hydrochloric acid does not react with the copper.

.....

8. Reactions between ionic compounds are fast whereas reactions between covalent compounds are slow.

.....

9. The rate of the chemical reaction increases by increasing temperature.

.....

10. The rate of the reaction of hydrochloric acid with the iron filings is faster than that with a piece of iron of the same mass.

.....

11. Although aluminum comes before zinc in chemical activity series, but it takes a longer time to react with hydrochloric acid practically.

.....

✹(6) What happen if:

1. Heating red mercuric oxide HgO.

.....

2. Putting a piece of magnesium in copper sulphate solution.

.....

3. Add a small piece of sodium metal to water.

.....

4. Increase in the concentration of the reactants. (According to the speed of the chemical reaction).

.....

5. Adding manganese dioxide to a test tube containing hydrogen peroxide.

.....

6. Replacing a piece of iron with iron filings has the same mass on reacting with diluted acids.

.....

7. Heating green copper carbonate.

.....

8. Adding silver nitrate solution to sodium chloride solution.

.....

9. To the number of collisions when adding a negative catalyst to a chemical reaction.

.....

10. To the colour of red mercuric oxide when it is heated.

.....

11. Adding hydrochloric acid to sodium carbonate salt.

.....

12. Increasing surface area according to the reactants.

.....

13. Heating blue copper hydroxide.

.....

14. Adding a negative catalyst to rapid reaction.

.....

15. Heating of sodium nitrate.

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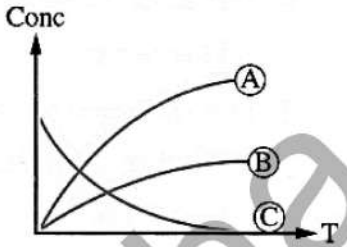
✹(7) Problems

1

$2NaNO_3 \xrightarrow{\Delta} 2NaNO_2 + O_2$

From the chemical equation and the opposite graph mention which curve represents the concentration of each :



1. Sodium nitrate.
2. Oxygen gas.
3. Sodium nitrite.

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2

From the opposite reaction :

① $\boxed{A} \xrightarrow{\Delta} H_2O + CuO$

② $2Na + 2H_2O \longrightarrow 2NaOH + \boxed{B} + heat$

③ $CuO + \boxed{B} \xrightarrow{\Delta} H_2O + \boxed{C}$

1. Write chemical formula for A B C
2. What is the type of reaction in ①, ②, ③
3. What is the name of chemical process which appears to black copper oxide in reaction ③ ?

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3

From the following two equations answer the following :

① $2(A) + 2Na \longrightarrow 2NaOH + (B) + heat$

② $(B) + CuO \xrightarrow{\Delta} Cu + (A)$

1. Write the chemical formula for the (A) & (B) substances.
2. How to detect the substance (B) ?
3. What is the type of reaction No. ①, and what is the type of reaction No. ② ?

.....

.....

.....

4

From the following table choose a statement from column (B) and another one from column (C) to be suitable for the items in column (A) and write a complete statement.

(A)	(B)	(C) Type of reaction
1. $NaNO_3$ 2. Al	a. decomposed by heat b. replace the hydrogen in water c. is formed in the form of white precipitate d. replace the hydrogen of the acid after a while.	e. Salt is formed and hydrogen gas evolves. f. When it reacts with silver chloride. g. Produce yellowish white substance and oxygen. h. Oxide is formed and oxygen evolves.

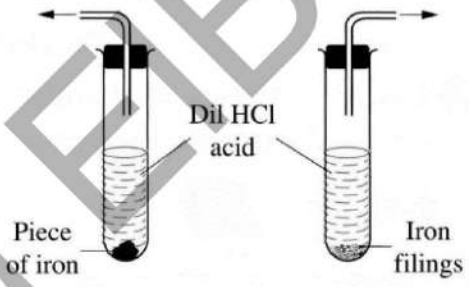
.....

.....

5

From the two opposite figures :

1. Express this reaction with a balanced symbolic chemical equation.
2. What is the factor that affects the speed of this reaction ?
3. What happens on replacing iron by copper ?



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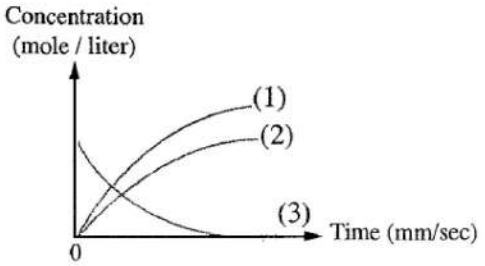
6

The opposite graph represents the rate of rapid decomposition of the substance of sodium azid. (which is present inside the air bag)

$2NaN_3 \xrightarrow[\text{spark}]{\text{Electric}} 2Na +$ .....



1. Complete the equation.
2. From the graph, write the name of compound indicated by each number.
3. Mention the importance of air bag.

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Model Answer

✹ (1) Write the scientific term :

1. Oxidation process
2. Reduction process
3. Speed of chemical reaction
4. Oxidase enzyme
5. Catalytic converter
6. Catalyst
7. Enzyme
8. Chemical reaction
9. Neutralization reaction
10. Simple substitution reaction
11. Oxidation
12. Positive catalytic reaction
13. Double substitution reaction
14. Reducing agent
15. Salt and water
16. Speed of chemical reaction
17. Oxidation process
18. Chemical reaction
19. Catalyst

✹(2) Choose the right answer:

1. B	7. C	13. B	19. B	25. B	31. A
2. C	8. C	14. A	20. C	26. C	32. A
3. A	9. B	15. C	21. A	27. D	33. C
4. B	10. B	16. D	22. B	28. C	34. A
5. A	11. B	17. B	23. C	29. B	35. A
6. C	12. C	18. D	24. D	30. B	

✹(3) Complete the following :

1. Thermal decomposition – simple substitution
2. 2HCl
3. Molecules
4. Oxidase
5. Salt – water
6. Decrease – increase
7. Product
8. 100
9. Chemical reaction
10. Thermal decomposition
11. Chlorine – sodium
12. NO_2 – O_2
13. Slower
14. Breaking – formation
15. Sulphate – metal oxide
16. Red
17. Salt – water
18. Reactant – product
19. Clear lime water
20. Hydrogen
21. Disappearance – appearance

✹(4) Correct the underlined words:

1. Carbon dioxide
2. Reduction
3. Negative catalyst
4. Faster
5. Fireworks
6. Oxygen
7. Slow
8. Red
9. Ions
10. White
11. Red
12. Increasing
13. Reducing agent
14. Carbon dioxide

(5) Give reason for:

1.

Because zinc come before hydrogen in the chemical activity series, so they replace the hydrogen of acid, while copper comes after hydrogen in the chemical activity series, so it can't replace the hydrogen of acid.

$$Zn + 2HCl \xrightarrow{dil.} ZnCl_2 + H_2\uparrow$$

2.

Because by increasing the number of reactants molecules, the number of probable collisions between them increases, so the speed of reaction increases.

3.

Because magnesium comes before copper in the chemical activity series, so it replaces copper in copper sulphate solution and copper precipitates as a red ppt.

$$Mg + CuSO_4 \longrightarrow MgSO_4 + Cu\downarrow$$

4.

Due to increasing the speed of chemical reaction by increasing the concentration of oxygen gas.

5.

Because the oxidase enzyme in sweet potato acts as a catalyst which increases the rate of decomposition of hydrogen peroxide into water and oxygen gas.

6.

Due to formation of silver chloride salt which doesn't dissolve in water.

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

7.

Because copper comes after hydrogen in the chemical activity series, so it can't replace the hydrogen of acid.

8.

Because the reactions of ionic compounds take place between ions, while the reactions of covalent compounds take place between molecules.

9.

Because by increasing the temperature, the number of probable collisions between reactants molecules increase, so the speed of reaction increases.

10.

Because the surface area in case of iron filings is larger than that in case of iron block and the speed of chemical reactions increases by increasing the surface area.

11.

Due to the presence of a layer of aluminum oxide (Al_2O_3) on aluminum surface, which takes time to separate from aluminum, which delays the starting of occurrence of the reaction.

✹(6) What happen if:

1.

A silvery precipitate of mercury is formed and oxygen gas evolves.

$2HgO \xrightarrow{\Delta} 2Hg + O_2\uparrow$

2.

The blue colour of copper sulphate disappears and a red precipitate of copper is formed.

$Mg + CuSO_4 \longrightarrow MgSO_4 + Cu\downarrow$

3.

A reaction take place and hydrogen gas evolves

$2Na + 2H_2O \longrightarrow 2NaOH + H_2\uparrow + heat$

4.

The speed of the chemical reaction increases, due to the increase in the number of probable collisions between reactant molecules.

5.

Hydrogen peroxide decomposes (breaks up) rapidly into water and oxygen gas evolves.

6.

The speed of the chemical reaction decreases.

7.

A black substance of copper oxide is formed and carbon dioxide gas evolves.

$CuCO_3 \xrightarrow{\Delta} CuO + CO_2\uparrow$

8.

A white precipitate of silver chloride is formed.

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

9.

The number of collisions decreases .

10.

The silvery colour of liquid mercury will be formed.

11.

An effervescence occurs due to evolving of bubbles of carbon dioxide gas.

$Na_2CO_3 + 2HCl \xrightarrow{dil.} 2NaCl + H_2O + CO_2\uparrow$

12.

The speed of chemical reaction increases.

13.

A black substance of copper oxide is formed and water vapour evolves.

$Cu(OH)_2 \xrightarrow{\Delta} CuO + H_2O\uparrow$

14.

The speed of the reaction will be decreased.

15.

A yellowish white substance of sodium nitrite is formed and oxygen gas evolves.

$2NaNO_3 \xrightarrow{\Delta} 2NaNO_2 + O_2\uparrow$

✹(7) Problems

1	1. Curve **(C)** 2. Curve **(B)** 3. Curve **(A)**
2	1. (A) chemical formula is $Cu(OH)_2$ (B) chemical formula is H_2 (C) chemical formula is Cu 2. Reaction (1) is thermal decomposition reaction. Reaction (2) is simple substitution reaction. Reaction (3) in oxidation and reduction reaction. 3. Reduction process.
3	1. (A) is H_2O (B) is $H_2\uparrow$ 2. In general , we detect H_2 gas by approching a burning match to it, so it burns with a pop sound. 3. Reaction No. (1) is simple substitution reaction. Reaction No. (2) is oxidation and reduction reaction.
4	1. $NaNO_3$ decomposed by heat, produce yellowish white substance and oxygen. 2. Al replace the hydrogen of the acid after a while, salt is formed and hydrogen gas evolves.
5	1. $Fe + 2HCl \longrightarrow FeCl_2 + H_2\uparrow$ 2. The surface area of the reactant. 3. No reaction ocurs.
6	1. $3\ N_2$ 2. **(1)** Nitrogen gas $(3N_2)$ **(2)** Sodium $(2N_2)$ **(3)** Sodium azid $(2\ Na\ N_3)$ 3. It is one of the most important safety means of car, where it inflated by nitrogen gas at an extreme speed on the occurrence of car accident.