

CHEMISTRY REVISION EXERCISE FOR S3A,B&C

1. a) what is allotropy
 - b) Name any two allotropic forms of carbon.
 - c) Which allotrope of carbon used to make the rod in the dry cell?
 - d) How soot and charcoal are formed?
 - e) Identify any two uses of soot and charcoal.
2. a) what is meant by flame?
 - b) How many zones are there in?
 - ii) A luminous flame
 - ii) A non -luminous flame
 - c) Differentiate physical change from chemical change
3. A) in terms of kinetic theory of matter explain how solid, liquid and gas are different
 - b) Give any three examples of physical and chemical change
 - c) What name is given to the following changes of states?
 - i) solid to liquid ii) liquid to gas iii) gas to solid
4. State the effect of the following according to the kinetic theory of matter.
 - a) Cooling on the speed of particles b) cooling on the strength of inter-particle forces
 - c) Heating on the speed of particles
5. Identify the perfect method of separating the following mixtures.
 - a) A mixture of roasted groundnuts and beans. b) A mixture of grains and chaff

c) A mixture of soil and water. d) A mixture of ethanol and black ink.

e) A mixture of two liquid with different boiling points (mixture of ethanol and water).

6. Calculate the percentage (%) of copper in copper (II) sulphate (CuSO_4), relative atomic masses, Cu: 64, S: 32 and O: 16

7. Using dot and cross diagrams, show how electrons are arranged in a molecule of Cl_2 , NH_3 and CO_2

8.

ATOMS	PROTONS	NEUTRONS	ELECTRONS	MASS NUMBERS
P	1	?	?	1
Q	?	6	?	12
R	15	?	?	31
S	?	12	12	?
T	?	?	18	37

a) Complete the table above

b) Write the electronic configuration of element P and T

9. The atomic number of an element X is 12

a) Write the electronic configuration of an element X

b) To which group and period of periodic table does X belong?

10. a) name all stapes of water purification .

b) Identify any four water pollutants

c) What are the methods used to prevent water pollution (give any three)

11. a) air is a mixture of different gases. Write down any three components of air and their percentages.

b) What is the active part of air?

12. Balance the following chemical reactions.



b) What is the observable colour change when a basic solution is mixed with:

i) Moist red litmus paper ii) moist blue litmus paper

14. a) what is meant by the term metallic bond ?

b) Write electronic configuration of : a) Cl Z: 17

b) Al^{3+} Z: 13 for Al

c) Fe Z: 26

15. Classify the following chemical compounds into ionic bond, covalent bond and coordinate dative bond. i) CH_4 , ii) NaCl , iii) NH_4Cl , iv) NH_3 , v) Al_2O_3 , vi) CCl_4

16. a) differentiate ductile from malleable.

b) Use dots and crosses to draw the structure of CCl_4 , and NH_4Cl

17. a) explain the metallic character of elements in the periodic table from : a) right to left

b) top to the bottom

b) Give any two physical properties of metals

c) Explain why metals are good conductors of electricity ?

d) basing on physical properties differentiate metals from non-metals.

18. a) explain the reactivity of metals when you move down the group.

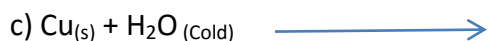
b) Explain why reactivity of non-metals decreases down the group.

19. a) between calcium and magnesium which one is likely to react with: i) hot water

ii) Cold water

b) Write a balanced chemical reaction in (i) and (ii) above

20. Complete the following chemical reactions.



21. Gap filling

a) sulphur is used for making b) silicon is used for making

c) Sodium is used in reactors.

22. Name the noble gas used in electrical bulb.

23. a) give any four dangers of polluted water

b) Write down the three Rs to prevent water pollution.

c) water pollution is responsible for wide number of deaths of infant.

i) microbial ii) radioactive iii) oil iv) heat

24. a) why was polythene banned in Rwanda?

b) Explain the term eutrophication and give its effects

c) Name any six steps of effective waste management

d) What is meant by briquetting?

25. give an example of chemical reaction which is:

a) combination reaction b) single displacement reaction c) double displacement reaction

d) decomposition reaction e) precipitation reaction

26. explain the following terms: a) exothermic reaction b) endothermic reaction c) neutralization reaction d) saturated solution) unsaturated solution

27. a) identify any two factors that affect the solubility of salts.

b) at 30°C , 7grams of sugar dissolves in 5grams of water to form a saturated solution. Find the solubility of sugar.

c) How can you identify Cu^{2+} in a sample of solution?

d) How can you identify the presence of Cl^{-} and SO_3^{2-} in a solution?

28. a) calculate the number of moles of 12.044×10^{23} helium atoms.

b) Calculate the number of particles in 0.1moles of carbon atoms.

29. Calculate the percentage of hydration in $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ given that Cu:63.5 , S:32, O:16 and H:1

30. An organic compound X is composed of 40% carbon , 6.72% hydrogen and 52.28% oxygen by mass.

(atomic masses: C:12,H:1,O:16)

a) Determine the empirical formula of compound X

b) Determine the molecular formula and molecular mass of X if its molar mass is 180g/mol.

31. a) what is meant by electrolyte ?

b) give an example of : i) weak electrolyte

ii) strong electrolyte

32. classify the following oxides in their respective type. CO_2 , CO, NO, NO_2 , SO_2 , FeO, ZnO, Na_2O , MgO, Al_2O_3 , H_2O balance with hydrochloric acid according to the equation:

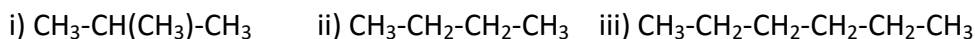


calculate the mass of MgCl_2 produced

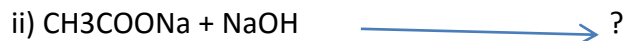
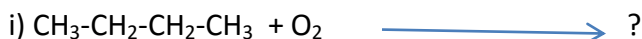
34. a) what is electrolysis?

b) give any two application of electrolysis.

35. a) name the following organic compounds.



b) complete the following chemical reaction and balance.



36. a) state three contrasting properties of diamond and graphite

b) Draw the crystal lattices of diamond and graphite and state how these lattices account for the differences in properties of two allotropes.

37. a) draw a well labeled diagram of the apparatus you would use to prepare carbon dioxide in the laboratory.

b) How can you test the presence of CO_2 .

c) Carbon dioxide was bubbled through lime water. Describe what was observed and write equation for the reaction that took place.

38. a) when lime stone is strongly heated, it decomposes into calcium oxide and carbon dioxide. Write the equation for the reaction.

b) Explain briefly why the proportion of carbon dioxide in the air remains constant.

c) Describe the reaction of carbon dioxide with coke (carbon).

39. Differentiate the following terms.

a) Soft water and hard water. b) Temporary hardness and permanent hardness.

b) State and explain three methods by which permanent hardness in water can be removed.

c) Give any three advantages of hard water over soft water.

40. a piece of marble (calcium carbonate) was placed in a beaker containing an excess of dilute hydrochloric acid and standing on a direct reading balance. The mass of beaker with its contents was recorded 100 seconds.

a) Why was there a decrease in mass? b) Write the equation for the reaction that took place.

c) Explain why the mass of remains constant after some time.

d) Write the formulae of two ions which remain in the final solution.

41. a) name a reagent that can be used to test for a carbonate and state what is observed when the reagent is used.

b) Write an ionic equation to show the reaction that takes place in (a).

42. a) name the two allotropes of carbon. b) give any two differences between the allotropes you named in (a).

c) Give any two uses for each of the allotrope.

43. a) name the compound that reacts with dilute hydrochloric acid to produce carbon dioxide.

b) Excess carbon dioxide was passed through ice-cold sodium hydroxide solution.

i) State what was observed. ii) Write equation for the reaction that took place.

c) Give the reason why:

i) Graphite conducts electricity whereas diamond does not. ii) Diamond is used to cut metals while graphite is used in pencils.

d) Concentrated sulphuric acid oxidises carbon to carbon dioxide as shown by the equation below.



Determine the mass of carbon that can react completely with a solution containing 39.2g of sulphuric acid. (C: 12, H: 1, S: 32, O: 16)

44. Carbon dioxide can be prepared in the laboratory by the action of an acid on a carbonate.

a) Write an ionic equation for the reaction .

b) Draw a labeled diagram of the apparatus that can be used in the laboratory to prepare and collect carbon dioxide.

c) Write equation to show how carbon dioxide reacts with each of the following and state what would be observed in each case.

i) Sodium hydroxide solution ii) calcium hydroxide solution iii) magnesium

d) Name one process in each case by which the concentration of carbon dioxide in atmosphere:

i) Increases

ii) decreases

45. a) i) name the raw materials used for the manufacturing ammonia in the Haber process.

ii) Write an equation for the reaction leading to the formation of ammonia.

b) Give any three factors that affect the formation of ammonia.

c) Dry ammonia was passed over heated copper (II) oxide until there was no farther change.

State what was observed and explain your answer.

46. A 9.45g of crystals of zinc nitrate was strongly heated in a boiling tube, at room temperature.

a) State what was observed. b) Write an equation of reaction that took place.

c) Determine the: i) mass of residue ii) volume of nitrogen dioxide evolved.

(Zn: 65, N: 14, O: 16, 1 mole of a gas at room temperature occupies 24Cm^3)

47. a) describe how a sample of dry ammonia can be prepared in the laboratory (diagram not required)

b) Name the reagent that can be used to test for ammonia and state what would be observed

c) Write the equation for the combustion of ammonia in oxygen.

48. a) draw a labeled diagram to show how a dry sample of ammonia can be prepared from ammonium chloride in laboratory.

b) Write an equation for the reaction leading to the formation of ammonia.

c) Dry ammonia was passed over heated lead (II) oxide.

i) State what was observed ii) write an equation for the reaction that took place.

d) Describe how ammonia can be converted into nitric acid. Use equations to illustrate your answer.

49. a) a piece of burning magnesium was plunged into a jar of nitrogen.

i) What is your observation? ii) Write the equation of reaction that took place

b) Water was added to a product of reaction in (a) and the resultant mixture was tested with litmus paper.

i) State what was observed ii) write an equation of reaction that took place.

c) Write other metal that reacts with nitrogen in the similar way to magnesium

50. a) name the process by which ammonia is obtained on a large scale.

b) one of the major uses of ammonia is the production of fertilizers. Two such fertilizers are ammonium sulphate, $(\text{NH}_4)_2\text{SO}_4$ and urea, $\text{CO}(\text{NH}_2)_2$. Calculate the percentage of nitrogen in:

i) Ammonium sulphate ii) urea (N: 14, H: 1, S: 32, O: 16 and C:12)

c) Which one of the fertilizers in (b) is better fertilizer? Explain your answer.

51. a) describe the industrial preparation of nitric acid from ammonia (diagram of the plant not required) . Your description should include equation for the reaction that occur.

b) Concentrated nitric acid was added to copper

i) What was observed? ii) Write the equation for the reaction that took place.

52. Ammonia solution was separately added drop wise until in excess to aqueous solutions of Al^{3+} , Pb^{2+} , Zn^{2+} , Cu^{2+} and Fe^{2+}

a) For each of the cations write an equation or equations for the reactions which took place.

b) State what is observed when ammonia solutions are separately added to solutions of cations mentioned.

53. a) Ammonia reacts with chlorine to form nitrogen and hydrogen chloride.

i) Write an equation for the reaction.

ii) In the reaction state whether chlorine is a reducing agent or oxidizing agent.

b) Write an equation for any reaction in which nitric acid functions as :

i) An acid

ii) an oxidizing agent

