N5 Chemistry
Unit 1: Chemical Changes & Structure
Homework 1.14

1. Which of the following compounds is a salt?

   A Magnesium chloride
   B Calcium carbonate
   C Sodium hydroxide
   D Iron(II) oxide

   Answer _____

2. Excess (extra) of zinc oxide, zinc carbonate and zinc hydroxide all react with dilute hydrochloric acid. Which of the following does **not** occur in **all** three reactions?

   A Water is formed.
   B Zinc chloride solution is formed.
   C A gas is evolved.
   D The acid is neutralised.

   Answer _____

3. Which of the following numbers is the same for lithium and oxygen atoms?

   A Mass number
   B Atomic number
   C Number of outer electrons
   D Number of occupied energy levels

   Answer _____

4. Which of the following pairs of solutions, when mixed, produce a precipitate?

   A Copper(II) sulfate and sodium nitrate
   B Barium chloride and sodium sulfate
   C Calcium hydroxide and potassium chloride
   D Sodium sulfate and dilute nitric acid

   Answer _____

5. A substance, **X**, has a melting point of 996°C and a boiling point of 1704°C. It only conducts electricity when molten or when dissolved in water.
   The structure of **X** is likely to be

   A ionic
   B metallic
   C covalent network
   D covalent molecular.

   Answer _____

6. Copper is a good conductor of electricity because

   A the atoms are free to vibrate
   B the atoms are in close contact
   C the atoms have the electron arrangement 2, 8, 18, 1
   D electrons can move readily from one atom to the next.

   Answer _____

7. Reactions can be represented using ionic equations. Which ionic equation shows a neutralisation reaction?

   A $2H_2O(\ell) + O_2(g) + 4e^- \longrightarrow 4OH^-(aq)$
   B $H^+(aq) + OH^-(aq) \longrightarrow H_2O(\ell)$
   C $SO_2(g) + H_2O(\ell) \longrightarrow 2H^+(aq) + SO_3^{2-}(aq)$
   D $NH_4^+(s) + OH^-(s) \longrightarrow NH_3(g) + H_2O(\ell)$

   Answer _____

8. Which of the following is not a salt?

   A Copper(II) sulfate
   B Sodium oxide
   C Magnesium chloride
   D Calcium nitrate

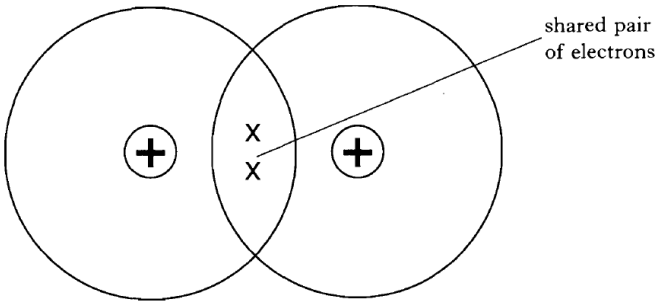
   Answer _____

9. Tetrafluoromethane is a covalent compound. Its formula is CF_4.

a) Draw a diagram to show the **shape** of a molecule of tetrafluoromethane.

1

b) The atoms in a hydrogen molecule are held together by a covalent bond. A covalent bond is a shared pair of electrons.



Explain how this holds the atoms together.

_____

_____

_____ 1

10. Calculate the number of moles in each of the following:

a) 20 g of calcium carbonate, $CaCO_3$

_____ moles 2

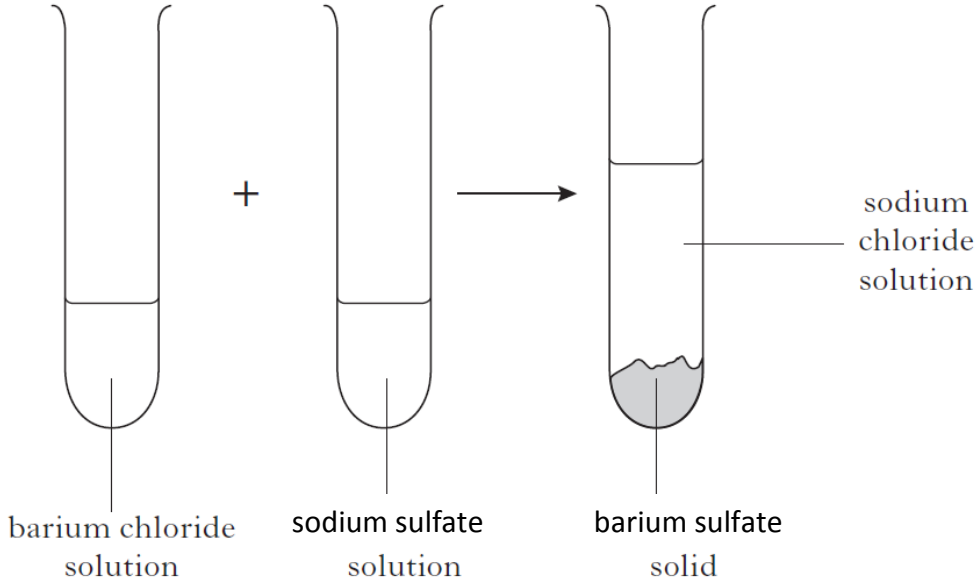
b) 18 g of glucose, $C_6H_{12}O_6$.

_____ moles 2

c) 2·2 g of lithium sulfate, Li_2SO_4.

_____ moles 2

11. A student carried out the following experiment.



a) During the reaction a solid was formed. Name the type of reaction taking place.

_____ 1

b) The equation for the reaction is

$$Ba^{2+}(aq) + 2Cl^{-}(aq) + 2Na^{+}(aq) + SO_4^{2-}(aq) \longrightarrow Ba^{2+}\,SO_4^{2-}(s) + 2Cl^{-}(aq) + 2Na^{+}(aq)$$

i) Rewrite the equation showing only the ions which react.

_____ 1

ii) What term is used to describe the ions which do not react?

_____ 1

12. Sodium nitrate and sodium carbonate are both white solids.
Using your knowledge of chemistry explain in some detail how you could determine which solid was which.

_____

_____

_____

_____

_____

_____

_____ 3

13. There are two different types of lithium atom, $_3^6Li$ and $_3^7Li$.

a) What name is used to describe the different types of lithium atom?

_____ 1

b) Complete the table to show the number of protons, neutrons and electrons in an atom of $_3^7Li$.

Particle	Number
proton	
neutron	
electron	

1

c) Lithium atoms react to form lithium ions. Give the electron arrangement for a lithium ion.

_____ 1

14. Crystals of magnesium sulfate can be made by adding excess magnesium oxide to sulfuric acid.

a) Name the type of chemical reaction which takes place.

_____ 1

b) What happens to the pH of the dilute acid as the magnesium oxide is added?

_____ 1

c) Describe how the excess magnesium oxide can be removed from the solution.

_____ 1

d) How could a dry sample of magnesium sulfate crystals be obtained from the solution?

_____ 1

e) Write a word equation for the reaction.

_____ 1

f) Write a balanced chemical equation for the reaction.

1

Total Marks 31