N5 Chemistry
Unit 3: Chemistry in Society
Homework 3.1

Name _____ **Teacher** _____

1. What is the correct formula for aluminium sulfate?

   A $AlSO_4$
   B $Al(SO_4)_3$
   C $Al_2(SO_4)_3$
   D $Al_3(SO_4)_2$

   Answer _____

2. 0·2 moles of a gas has a mass of 12·8 g.

   Which of the following could be the molecular formula for the gas?

   A SO_2
   B CO
   C CO_2
   D NH_3

   Answer _____

3. When nickel(II) chloride solution is added to sodium carbonate solution an insoluble solid is formed.

   A sample of the solid can be separated from the mixture by

   A evaporating
   B distillation
   C burning
   D filtration.

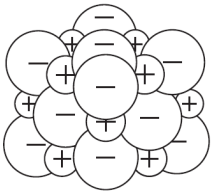
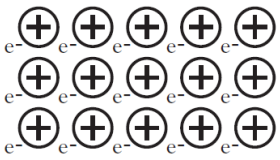
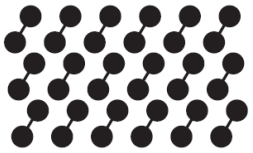
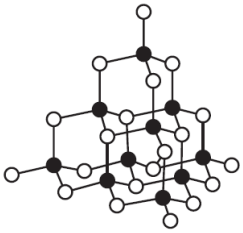
   Answer _____

4. Which of the following could be the molecular formula for an alkene with one carbon-to-carbon double bond?

   A C_4H_{12}
   B C_4H_{10}
   C C_4H_8
   D C_4H_6

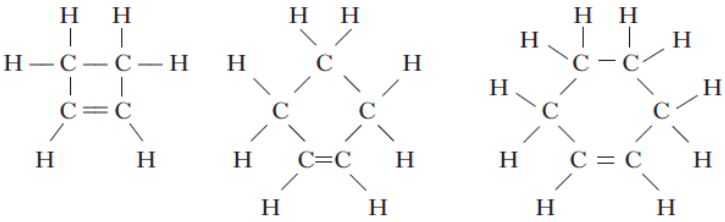
   Answer _____

5. Which of the following diagrams could be used to represent the structure of a metal?

   A 
   B 
   C 
   D 

   Answer _____

6. Three members of the cycloalkane homologous series are:



   The general formula for the this homologous series is

   A C_nH_{2n+2}
   B C_nH_{2n}
   C C_nH_{2n-2}
   D C_nH_{2n-4}.

   Answer _____

7. The formula for iron(III) oxide is Fe_2O_3.

a) What is the charge on the oxide ion? _____ 1

b) The iron(III) oxide can be reduced to give iron metal. Write the ion-electron equation to show the iron(III) ions changing to iron atoms.

_____ 1

c) Complete the table to show the numbers of particles in the iron ion $^{56}_{26}Fe^{3+}$.

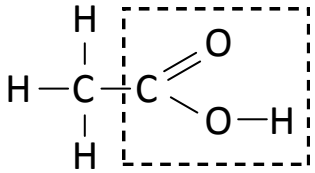
Type of particle	Number
Protons	
Neutrons	
Electrons	

2

8. Ethanoic acid is a member of the family of carboxylic acids.

a) State a use for ethanoic acid. _____ 1

b) The functional group in ethanoic acid has been highlighted.



Name the functional group. _____ 1

c) Ethanoic acid can be produced by reacting methanol with carbon monoxide.

$$CH_3OH\ (l) + CO(g) \longrightarrow CH_3COOH(l)$$

Calculate the mass of ethanoic acid produced from 16 grams of methanol.
Space for working and answer

_____ grams 3

9. A student writes the following statement. The statement is incorrect.

"Alkalis have a pH value greater than 7 because of their OH (hydroxyl) groups."

Explain the mistake in the student's reasoning.

_____

_____

_____

_____ 2

10. Nitrogen trifluoride, NF_3, is used in the manufacture of plasma screens.

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

1

b) Draw a diagram showing all the outer electrons to represent a molecule of nitrogen trifluoride.

1

c) The atoms in nitrogen trifluoride are held together by covalent bonds.
Explain clearly how the atoms are held together by covalent bonds.

_____

_____

_____ 1

d) Nitrogen and fluorine react together to form nitrogen trifluoride as shown in the equation:

$$N_2 + F_2 \longrightarrow NF_3$$

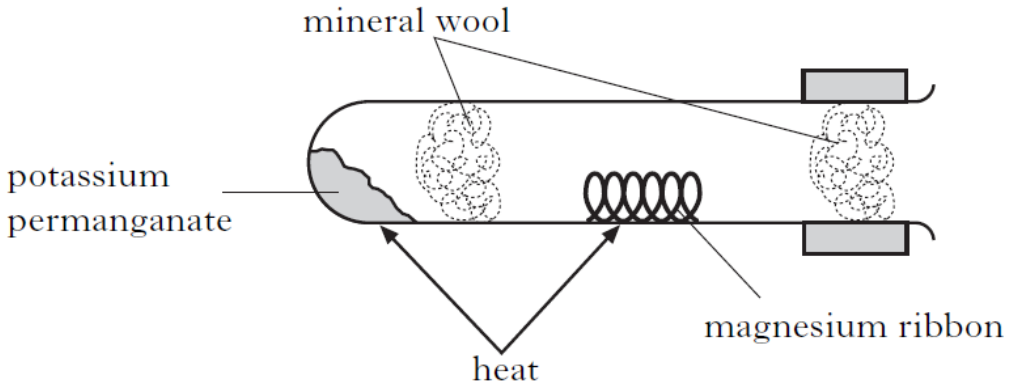
Balance this chemical equation. 1

11. A student's report is shown for the reaction of three different metals with oxygen.

Title. Reactions of Metals with Oxygen. **Date.** 15/05/14

Aim. The aim of the experiment was to place zinc, copper and magnesium in order of reactivity.

Procedure. The apparatus required to carry out the experiment was collected and assembled as shown.



Results

Metal	Observations
zinc	moderately fast reaction
magnesium	fast reaction
copper	slow reaction

a) Write the formula for potassium permanganate. _____ 1

b) Why is potassium permanganate used in this experiment?

_____ 1

c) Write a balanced chemical equation for the reaction of magnesium and oxygen.

_____ 1

d) What type of chemical reaction occurs when a metal reacts with oxygen?

_____ 1

e) List the three metals, which reacted, in order of reactivity with the most reactive first.

_____ 1

Total Marks 26