SCIENCE (Chemistry)

Chemical Calculations Using Mole (V)

Revision For Calculating Relative Atomic Mass and Relative Molecular Mass

Name:_____( ) Class:_____ Date:_____

Exercise

1. Complete the following table by filling in the chemical symbols for the ionic compounds formed

Negative Ion / Positive Ion	Cl^-	O^{2-}	NO_3^-	OH^-	CO_3^{2-}	SO_4^{2-}
Na^+	NaCl	Na_2O	$NaNO_3$	NaOH	Na_2CO_3	Na_2SO_4
(a) H^+						
(b) K^+						
(c) Ca^{2+}						
(d) Mg^{2+}						
(e) Cu^{2+}						
(f) Al^{3+}						
(g) Fe^{3+}						

2. Complete each of the following ionic equations.

e.g $Na^+(aq) + OH^-(aq) \longrightarrow NaOH(aq)$

a) $Ag^+(aq) + Cl^-(aq) \longrightarrow$ _____(s)

b) $Ba^{2+}(aq)$ + _____(aq) $\longrightarrow BaSO_4(s)$

c) OH-(aq) + _____(aq) $\longrightarrow H_2O(l)$

d) $Mg^{2+}(aq) + 2OH^-(aq) \longrightarrow$ _____(s)

e) _____(aq) + 3OH-(aq) $\longrightarrow Fe(OH)_3(s)$

f) K^+ (aq) + _____ (aq) $\longrightarrow$ KCl (aq)

3. Write balanced chemical equations for each of the following reactions.

e.g. hydrogen + oxygen $\longrightarrow$ water

$2H_2$ + O_2 $\longrightarrow$ $2H_2O$

a) calcium + water $\longrightarrow$ hydrogen + calcium hydroxide solution

_____

b) Iron + hydrochloric acid $\longrightarrow$ iron(III) chloride solution + hydrogen

_____

c) iron + chlorine gas $\longrightarrow$ iron(III) chloride

_____

d) zinc + steam $\longrightarrow$ zinc oxide + hydrogen

_____

e) hydrogen + copper(II) oxide $\longrightarrow$ copper + water vapour

_____

f) magnesium + sulphuric acid $\longrightarrow$ hydrogen + magnesium sulphate solution

_____

4. Write balanced chemical equations for each of the following reactions.

a) Methane gas burns in oxygen to form carbon dioxide and water.

_____

b) Carbon burns in air to form carbon dioxide.

_____

c) Sodium reacts with oxygen gas in the air to form sodium oxide.

_____

d) Magnesium burns in oxygen gas to produce magnesium oxide.

_____

e) When copper(II) carbonate is heated, it breaks down into copper(II) oxide and carbon dioxide which is given off.

_____

5. Write down the relative atomic mass of each of the following elements.

Element	Relative atomic mass, $\mathbf{A_r}$	Element	Relative atomic mass, $\mathbf{A_r}$
a) Lithium, Li		i) Oxygen, O	
b) Sodium, Na		j) Sulphur, S	
c) Magnesium, Mg		k) Fluorine, F	
d)Calcium, Ca		l) Chlorine, Cl	
e) Aluminium, Al		m) Neon, Ne	
f) Silicon, Si		n) Iron, Fe	
g) Phosphorus, P		o) Copper, Cu	
h) Nitrogen, N		p) Zinc, Zn	

6. Work out the relative molecular mass of each of the following compounds.

e.g.1 A_r of S = 32, A_r of O = 16

M_r of SO_2 = 32 + (2 x 16) = 64

e.g.2 A_r of Ca = 40, A_r of O = 16, A_r of H = 1

Mr of $Ca(OH)_2$ = 40 + 2 x (16 +1) = 74

compound	Relative molecular mass, $\mathbf{M_r}$	compound	Relative molecular mass, $\mathbf{M_r}$
a) H_2O		k) NH_4Cl	
b) CO_2		l) H_2CO_3	
c) NaCl		m) $Zn(OH)_2$	
d) HCl		n) $Al(OH)_3$	
e) NaOH		o) $Ca(NO_3)_2$	
f) $FeSO_4$		p) $Pb(NO_3)_2$	
g) $CuCO_3$		q) $Fe_2(SO_4)_3$	
h) Al_2O_3		r) Na_2CO_3	
i) Fe_2O_3		s) CuO	