Year 10 Science

Chemical Reactions

Instructions: 1. Answer all questions on this paper.

End of Unit
25 marks

Date

Name _____ **Class** _____

1 Complete the following: (1)

A **chemical reaction** is a process in which one or more starting substances, **the** _____.,

are transformed into one or more different substances, **the** _____.

2 Which of the following chemical equations are balanced (Indicate by circling). (2)

a) $Zn + 2HCl \rightarrow ZnCl_2 + H_2$ Balanced Unbalanced

b) $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$ Balanced Unbalanced

c) $H_2SO_4 + 2NaOH \rightarrow Na_2SO_4 + 2H_2O$ Balanced Unbalanced

d) $6CO_2 + 6H_2O \rightarrow 6O_2 + C_6H_{12}O_6$ Balanced Unbalanced

3 Balance each of the following chemical equations: (4)

a) $H_2 + Cl_2 \rightarrow HCl$

b) $CaCO_3 \rightarrow CaO + CO_2$

c) $CH_4 + O_2 \rightarrow CO_2 + H_2O$

d) $Mg(OH)_2 + H_2SO_4 \rightarrow MgSO_4 + H_2O$

4 Classify each of the following chemical reactions as either synthesis, decomposition, single replacement, or double replacement. (4)

a) $2Na + Cu(OH)_2 \rightarrow 2NaOH + Cu$ _____

b) $3H_2 + N_2 \rightarrow 2NH_3$ _____

c) $2HNO_3 + Ca(OH)_2 \rightarrow Ca(NO_3)_2 + 2H_2O$ _____

d) $CaCO_3 \rightarrow CaO + O_2$ _____

5 **Collison theory** is used to explain why factors affect the reaction rate. (4)
Collision theory suggests that a chemical reaction occurs when the reactant particles collide with each other with enough energy to produce a reaction.

a) Use collison theory to explain why increasing temperature increases the chemical reaction rate.

_____

_____

_____

b) Use collison theory to explain why increasing the concentration of reactants increases the chemical reaction rate.

_____

_____

_____

6 **Fuels** are materials that are able to release energy in the form of heat energy when combusted (Combined with oxygen).. (8)

a) Give two examples of a liquid fuel: _____ _____

b) Write a symbolic balanced equation for the combustion of petrol (summarised as C_8H_{18}).

_____

c) Give two examples of a gaseous fuel: _____ _____

d) Write a symbolic balanced equation for the combustion of methane (natural gas CH_4).

_____

7 The active metals list will help predict whether a metal will react with a solution in single replacement reactions. Metals with a higher reactivity (i.e. higher in the list) will replace a metal with lower reactivity. Predict whether each of the following reactions will happen. (2)

Predict whether each of the following reactions will happen.(Indicate by circling)

Metal activity

Metal	Symbol
Sodium	Na
Calcium	Ca
Magnesium	Mg
Aluminium	Al
Zinc	Zn
Iron	Fe
Tin	Sn
Lead	Pb
Copper	Cu
Silver	Ag

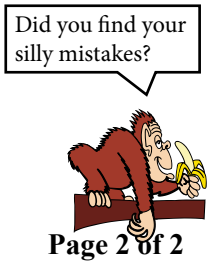
More reactive

a) $Zn + CuCl_2$ ➔ Will react Won't react

c) $Pb + ZnSO_4$ ➔ Will react Won't react

d) $Zn + MgCO_3$ ➔ Will react Won't react

e) $Ca + Sn(NO_3)_2$ ➔ Will react Won't react



------000O000------