The fundamental ideas in chemistry

Mark scheme

1. electron
nucleus
neutron

each for 1 mark

[3]

2. (a) (i) B 1

(ii) D 1

(b) A and B – only one type of atom 1

C and D – more than one type of atom 1

accept element for atom
ignore the word 'mixture'

(chemically) bonded 1

accept (chemically) joined or similar idea of joined

[5]

3. B carbon monoxide 1

CO 1

accept carbon oxide
*do **not** credit carbon dioxide*
*do **not** credit if any superscripts **or** subscripts used but accept C_1O_1,*
accept OC
*do **not** credit if obviously lower case*

C water 1
H_2O 1

accept hydrogen oxide
do not accept hydrogen hydroxide
*do **not** credit if obviously lower case **or** if 2 not subscript*
*do **not** accept HOH*
accept OH_2

D ammonia 1
NH_3 1

do not accept ammonium
*do **not** credit if obviously lower case, **or** if 3 not subscript*
*accept nitrogen hydride **or** hydrogen nitride*
*do **not** accept hydrogen nitrate **or** nitrite*
allow H_3N

[6]

4.
- correct reactants (i.e. sodium + water either way round)
- correct products (i.e. sodium hydroxide + hydrogen, either way round)
- arrow → / =

[do not allow produce/makes or similar]
[do not allow symbols or formulae] each for 1 mark

[3]

5. correct use of 'react'/'reaction'/reactants'/combine (not mixed/added/join)
correct use of 'produce'/'products'/gives/forms/makes/creates reactants correctly identified

each for 1 mark

products correctly identified

(Reactants must be correctly identified for 'react' mark to be awarded. Similarly for products)
(magnesium reacts with zinc oxide to produce magnesium oxide and zinc or similar, will gain all 4 marks)
Oxidise or reduce given correctly can be credited <u>both</u> the marks for react and produce

[4]

6. (a) react with oxygen / oxidise / burn in oxygen / burning / combustion **or** tungsten to tungsten oxide **or** makes an oxide — 1

key idea is oxidation
ignore breaking ignore fire / flames / exothermic
ignore react with air

(b) it is (very) unreactive / not reactive / inert / does not react with tungsten **or** it is a noble gas **or** it is in group 0 or 8 or 18 — 1

*do **not** accept unreactive / inert metal **or** argon is not <u>very</u> reactive*

full outer shell (of electrons) / 8 electrons in outer shell — 1

does not need to gain / lose / swap / transfer / share electrons **or** does not need to form bonds — 1

does not bond ionically / covalently

[4]

7. (a) Na_2CO_3 — 1

(b) (i) **A** — 1

(ii) loses — 1

electrons — 1

[4]

8. (a) $\underline{2}\ H_2 + O_2 \rightarrow \underline{2}\ H_2O$ — 2

each for 1 mark

(b) hydrogen and oxygen — 2

gains 1 mark

but 2 hydrogen and 1 oxygen

gains 2 marks

[4]

9. (a) (i) made up of one sort of atom — 1

*accept it is in the periodic table **or** has its own symbol*

(ii) nitrogen / N / N_2 **or** oxygen / O / O_2 — 1

*do **not** accept argon **or** helium*
*do **not** accept oxide*

	(b)	(i)	compound	1
			carbon	1
		(ii)	bond	1

[5]

10. (a) 56g 1

for 1 mark

(b) 44 tonnes 1

for 1 mark

[2]