The fundamental ideas in chemistry

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 *accept carbon oxide* 1

*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 *accept hydrogen oxide* 1

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 *do not accept ammonium* 1

NH_3 *do **not** credit if obviously lower case, **or** if 3 not subscript* 1

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

[3]

5. correct use of 'react'/'reaction'/reactants'/combine (not mixed/added/join) 3
correct use of 'produce'/'products'/gives/forms/makes/creates reactants
correctly identified

each for 1 mark

products correctly identified 1

(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 both 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 very 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) $2\ H_2 + O_2 \rightarrow 2\ H_2O$ *each for 1 mark* — 2

(b) hydrogen and oxygen *gains 1 mark* — 2

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]