GCSE Chemistry A (Gateway Science)

J248/04 Chemistry A C4-C6 and C7 (Higher Tier)

Question Set 1

C4: Predicting and identifying reactions and products

Multiple Choice Questions

1 Which statement describes the **advantages** of instrumental methods of analysis?

A Instruments can analyse very small amounts and carry out the analyses slowly.

B Instruments are very accurate and use large amounts of substances.

C Instruments are very accurate and carry out the analyses slowly.

D Instruments are very accurate and can run all the time.

Your answer ☐ **[1]**

2 A student tests a solution for **chloride ions**.

She adds dilute nitric acid to the solution. She then adds a few drops of silver nitrate solution. Why does she need to add dilute nitric acid in this test?

A To increase the pH of the solution.

B Nitrate ions are needed for the test to work.

C To make sure that no carbonate ions are present.

D The test only works in alkaline conditions.

Your answer ☐ **[1]**

3 Which statement about a **mass spectrum** of a molecule is correct?

A Each peak represents an atom in the molecule.

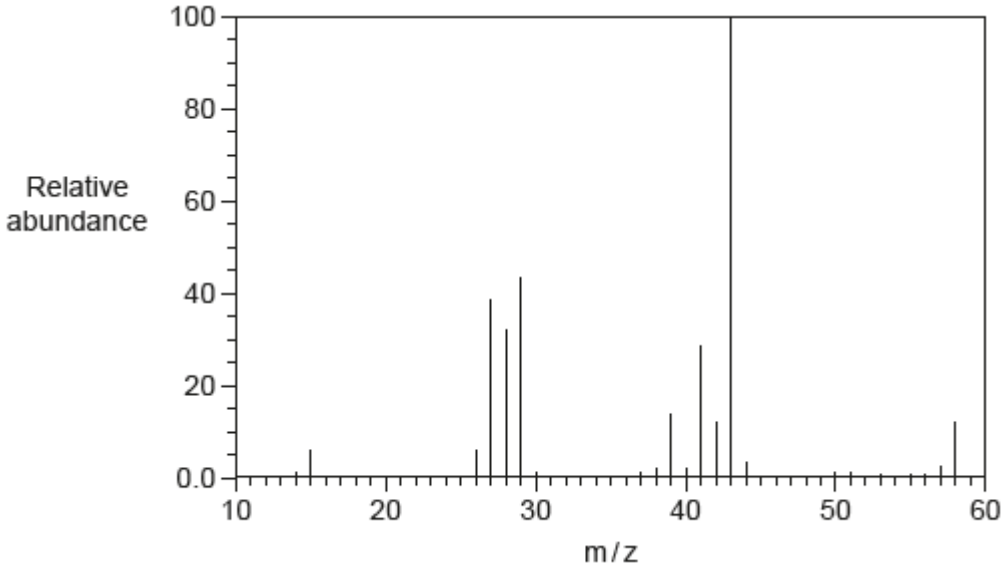
B The charge to mass ratio of the molecular ion peak is equal to the relative formula mass of the molecule.

C The peak with the highest relative abundance represents the molecular ion.

D The peak on the far right of the spectrum represents the molecular ion.

Your answer ☐ **[1]**

4 Look at the mass spectrum of a carbon compound.



Which carbon compound is the mass spectrum from?

A C_2H_2

B $C_2H_5^+$

C $C_3H_7^+$

D C_4H_{10}

Your answer ☐ **[1]**

5 Look at the data about four elements.

Element	Melting point (°C)	Density (g/cm^3)	Ions formed
A	98	0.97	A^+
B	–101	0.0032	B^-
C	1535	7.9	C^{2+}, C^{3+}
D	660	2.7	D^{3+}

Which element is a transition element?

Your answer ☐ **[1]**

6 Chlorine can displace iodine from iodide ions.

Which equation represents this reaction?

A $Cl + I^- \rightarrow Cl^- + I$

B $Cl^- + I_2 \rightarrow 2I^- + Cl_2$

C $Cl_2 + 2I^- \rightarrow 2Cl^- + I_2$

D $Cl_2 + I^- \rightarrow 2Cl^- + I$

Your answer ☐

[1]

7 Group 1 elements get more reactive down the group.

Which statement explains why?

A The outer electron is closer to the nucleus and lost more easily.

B The outer electron is further from the nucleus and lost more easily.

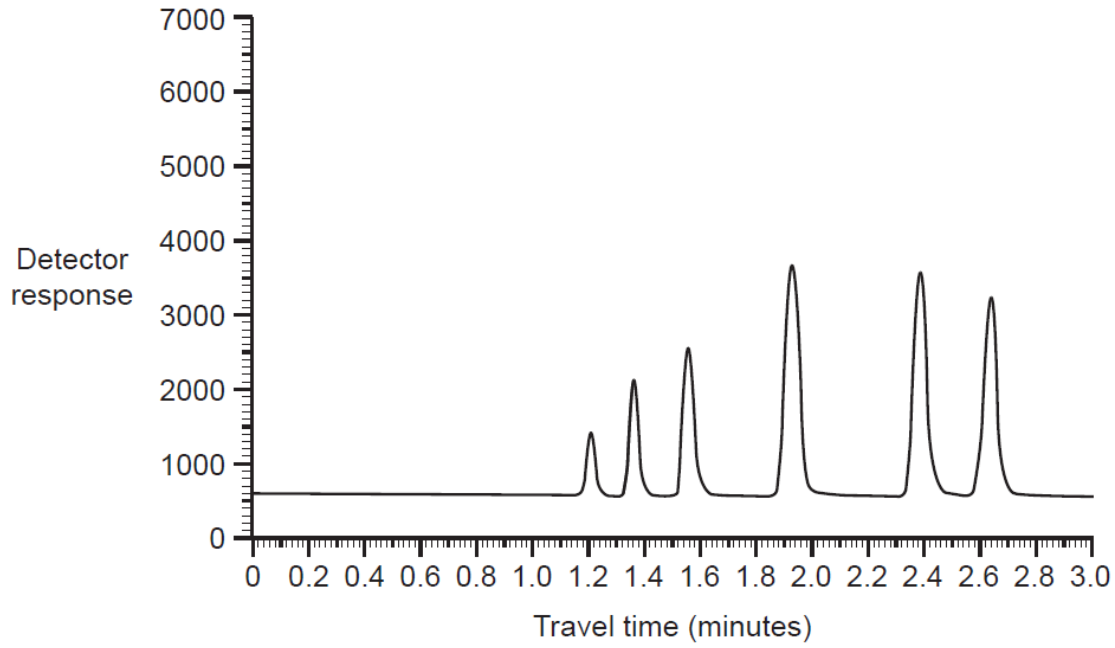
C There is less shielding from the inner electrons.

D There is more attraction between the nucleus and the outer electron down the group.

Your answer ☐

[1]

8 A gas chromatogram is a chart that represents different substances in a mixture.



Which of the following statements about a gas chromatogram is **not** correct?

A A gas chromatogram can detect very small amounts of substances.

B One compound produces several peaks.

C The area of each peak shows the relative amount of each substance.

D The retention time is different for different substances.

Your answer ☐ **[1]**

9 A student wants to test the purity of a liquid by testing its boiling point.

The actual boiling point of the pure liquid is 85 °C.

Which equation represents the percentage (%) difference between the student's value and the actual value?

A $\%\ \text{difference} = 100 \times \frac{(\text{student's value in °C}) - 85\,°C}{85\,°C}$.

B $\%\ \text{difference} = 100 \times \frac{85\,°C - (\text{student's value in °C})}{85\,°C}$.

C $\%\ \text{difference} = \frac{(\text{student's value in °C}) - 85\,°C}{85\,°C}$.

D $\%\ \text{difference} = \frac{85\,°C - (\text{student's value in °C})}{85\,°C}$.

Your answer ☐ **[1]**

10 Which statement is correct for a Group 1 element?

A It dissolves in water to form a bleach.

B It is an inert gas.

C It is a non-metal.

D It reacts with water to form hydrogen.

Your answer ☐ **[1]**

11 A student is testing sodium carbonate solution.

She adds barium chloride solution followed by excess dilute hydrochloric acid.
Which of these observations would **not** be seen?

A Colourless solution at the end

B Gas bubbles when the dilute acid is added

C White precipitate formed when the barium chloride solution is added

D White precipitate formed when the dilute acid is added

Your answer ☐ **[1]**

12 A student reacts some metals with different salt solutions and records her results.

She places a tick (✓) in her results table if she sees a chemical change and a cross (✗) if there is no reaction.

Some of the boxes are blanked out.

	Magnesium chloride	**Silver nitrate**	**Copper(II) sulfate**	**Iron(II) sulfate**
Magnesium		✓	✓	✓
Silver	✗		✗	✗
Copper	✗	✓		✗
Iron	✗	✓	✓	

Which metal has the **least** tendency to form a positive ion?

A Copper

B Iron

C Magnesium

D Silver

Your answer ☐ **[1]**

Total Marks for Question Set 1: 12

The Periodic Table of the Elements

(1)	(2)											(3)	(4)	(5)	(6)	(7)	(0)
1																	18
1 **H** hydrogen 1.0	2											13	14	15	16	17	2 **He** helium 4.0
3 **Li** lithium 6.9	4 **Be** beryllium 9.0											5 **B** boron 10.8	6 **C** carbon 12.0	7 **N** nitrogen 14.0	8 **O** oxygen 16.0	9 **F** fluorine 19.0	10 **Ne** neon 20.2
11 **Na** sodium 23.0	12 **Mg** magnesium 24.3	3	4	5	6	7	8	9	10	11	12	13 **Al** aluminium 27.0	14 **Si** silicon 28.1	15 **P** phosphorus 31.0	16 **S** sulfur 32.1	17 **Cl** chlorine 35.5	18 **Ar** argon 39.9
19 **K** potassium 39.1	20 **Ca** calcium 40.1	21 **Sc** scandium 45.0	22 **Ti** titanium 47.9	23 **V** vanadium 50.9	24 **Cr** chromium 52.0	25 **Mn** manganese 54.9	26 **Fe** iron 55.8	27 **Co** cobalt 58.9	28 **Ni** nickel 58.7	29 **Cu** copper 63.5	30 **Zn** zinc 65.4	31 **Ga** gallium 69.7	32 **Ge** germanium 72.6	33 **As** arsenic 74.9	34 **Se** selenium 79.0	35 **Br** bromine 79.9	36 **Kr** krypton 83.8
37 **Rb** rubidium 85.5	38 **Sr** strontium 87.6	39 **Y** yttrium 88.9	40 **Zr** zirconium 91.2	41 **Nb** niobium 92.9	42 **Mo** molybdenum 95.9	43 **Tc** technetium	44 **Ru** ruthenium 101.1	45 **Rh** rhodium 102.9	46 **Pd** palladium 106.4	47 **Ag** silver 107.9	48 **Cd** cadmium 112.4	49 **In** indium 114.8	50 **Sn** tin 118.7	51 **Sb** antimony 121.8	52 **Te** tellurium 127.6	53 **I** iodine 126.9	54 **Xe** xenon 131.3
55 **Cs** caesium 132.9	56 **Ba** barium 137.3	● 57–71 lanthanoids	72 **Hf** hafnium 178.5	73 **Ta** tantalum 180.9	74 **W** tungsten 183.8	75 **Re** rhenium 186.2	76 **Os** osmium 190.2	77 **Ir** iridium 192.2	78 **Pt** platinum 195.1	79 **Au** gold 197.0	80 **Hg** mercury 200.6	81 **Tl** thallium 204.4	82 **Pb** lead 207.2	83 **Bi** bismuth 209.0	84 **Po** polonium	85 **At** astatine	86 **Rn** radon
87 **Fr** francium	88 **Ra** radium	● 89–103 actinoids	104 **Rf** rutherfordium	105 **Db** dubnium	106 **Sg** seaborgium	107 **Bh** bohrium	108 **Hs** hassium	109 **Mt** meitnerium	110 **Ds** darmstadtium	111 **Rg** roentgenium	112 **Cn** copernicium		114 **Fl** flerovium		116 **Lv** livermorium		

Key
atomic number
Symbol
name
relative atomic mass