

## Mark schemes

## Q1.

- (a) (similarity)  
both have one outer (shell)  
electron  
*allow energy level for shell*  
*allow same number of outer (shell) electrons* 1
- (difference)  
sodium has 3 shells but  
potassium has 4 shells  
*allow potassium has more shells*  
*allow (different) number of shells* 1
- (b) any **two** from:  
  - effervescence / bubbles / fizzing  
*ignore gas produced*
  - (potassium) floats
  - (potassium) moves around
  - (potassium) becomes smaller
  - (potassium) melts  
*allow (potassium) forms a ball*  
*ignore colour of flame*
  - flame
  - explosion
 2
- (c) blue / violet / purple 1
- (the solution is) alkaline  
*allow (the solution) contains*  
*OH<sup>-</sup> (ions)*  
*allow (the solution) contains hydroxide ions*  
*allow the solution is basic* 1
- (d) all five points correctly plotted  
*allow a tolerance of  $\pm \frac{1}{2}$  a small square*  
*allow 1 mark for three or four points correctly plotted* 2
- (e) 3.4 (mg/cm<sup>3</sup>)  
*allow a value in the range 3.0 to 3.8 (mg/cm<sup>3</sup>)* 1
- (f) chlorine and potassium bromide 1
- (g) relative molecular mass increases and boiling point increases 1

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**Q2.**

- (a) for elements that had not been discovered (at that time)

*allow for missing elements***or**

so that elements with similar properties are grouped together

*ignore references to atomic number / mass / weight*

1

- (b) Mendeleev

1

- (c) noble gases

1

- (d) the elements all have one electron in the outer shell

1

- (e) 63 (°C)

*allow a value in the range 49 to 88 (°C)*

1

- (f) any
- one**
- from:

- floats
- moves (on the surface)
- melts

*allow forms a ball*

- fizzes / bubbles
- flame

*ignore colour of flame**allow explodes / disappears**ignore references to heat / temperature / sounds*

1

- (g)

Element	State at 150 °C	Symbol	Formula of the compound with hydrogen
Fluorine	gas	F	HF
Chlorine	<b>gas</b>	Cl	HCl
Bromine	gas	Br	HBr
Iodine	liquid	I	HI
Astatine	solid	At	<b>HAt</b>

2

- (g) Br
- <sub>2</sub>

1

[9]