

1 Ammonia is used to make ammonium nitrate.

Calculate the relative formula mass (Mr) of ammonium nitrate,  $\text{NH}_4\text{NO}_3$

Relative atomic masses (Ar): H = 1; N = 14; O = 16

14 + 4 + 14 + 48 [1 mark]

Remember to take into account the small numbers after the element.

The right answer will get you two marks but my advice is ALWAYS show your working, in case you make a mistake.

Relative formula mass = 80 [2 marks]

(2 marks)

1 (a) (i) Potassium nitrate is a fertiliser with the formula,  $\text{KNO}_3$

The relative formula mass (Mr) of potassium nitrate is 101.

Calculate the percentage by mass of potassium in potassium nitrate.

Relative atomic masses (Ar): N = 14; O = 16; K = 39

39 / 101 [1 mark]

38.6 or 40 [2 marks]

(2 marks)

1 (b) A metal oxide has a relative formula mass (Mr) of 81. The formula of this metal oxide is XO.

X is not the correct symbol for the metal.

The relative atomic mass (Ar) of oxygen is 16. Calculate the relative atomic mass (Ar) of metal X

81 - 16 [1 mark]

Relative atomic mass (Ar) = 65 [2 marks]

(2 marks)

Use your answer to part (a)(i) and the periodic table on the Data Sheet to name metal X.

The name of metal X is Zinc [1 mark]

(1 mark)

**Total (7 marks)**

- 2 Swimming pools are treated in order to kill microbes. One type of treatment is adding calcium hypochlorite tablets to the water.

Calcium hypochlorite formula is  $\text{CaCl}_2\text{O}_2$

- 2 (a) (i) Calculate the relative formula mass ( $M_r$ ) of calcium hypochlorite.

Relative atomic masses: O = 16; Cl = 35.5; Ca = 40.

$$40 + 71 + 32 \text{ [1 mark]}$$

Relative formula mass ( $M_r$ ) of calcium hypochlorite = 143 [2 marks]  
(2 marks)

- (2) (a) (ii) Calculate the percentage by mass of chlorine in calcium hypochlorite.

$$71 / 143 \text{ [1 mark]}$$

Percentage by mass of chlorine in calcium hypochlorite = 49.6 or 49.7 % [2 marks]  
(2 marks)

- (2) (a) (iii) Calculate the mass of chlorine in a 20 g tablet of calcium hypochlorite.

$$49.6/100 \times 20 \text{ or } .496 \times 20 \text{ [1 mark]}$$

A correct answer based on your calculations would get you most of the marks here, if not all.

Mass of chlorine = 9.93 g  
(1 mark)

**Total (5 marks)**