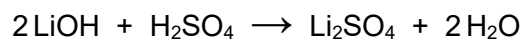


**0 7**

Lithium hydroxide reacts with sulfuric acid to produce lithium sulfate.

The equation for the reaction is:

**0 7 . 1**

What type of reaction is this?

**[1 mark]**

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**0 7 . 2**

Calculate the relative formula mass ( $M_r$ ) of sulfuric acid ( $\text{H}_2\text{SO}_4$ ).

Relative atomic masses ( $A_r$ ): H = 1 O = 16 S = 32

**[2 marks]**

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Relative formula mass ( $M_r$ ) = \_\_\_\_\_



**0 7 . 3** Calculate the percentage by mass of oxygen in lithium sulfate ( $\text{Li}_2\text{SO}_4$ ).

Relative atomic mass ( $A_r$ ): O = 16

Relative formula mass ( $M_r$ ):  $\text{Li}_2\text{SO}_4 = 110$

Give your answer to 2 significant figures.

**[4 marks]**

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Percentage by mass of oxygen (2 significant figures) = \_\_\_\_\_ %

**0 7 . 4** A solution of lithium sulfate contains 0.30 g of lithium sulfate in  $25 \text{ cm}^3$ .

Calculate the concentration of lithium sulfate in  $\text{g/dm}^3$ .

**[3 marks]**

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Concentration = \_\_\_\_\_  $\text{g/dm}^3$

**10**

**END OF QUESTIONS**



**Question 7**

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.1	neutralisation	allow exothermic	1	AO1 5.4.2.2 RPA8

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.2	$(M_r =)$ $(1 \times 2) + 32 + (4 \times 16)$  $= 98$		1	AO2 5.3.1.2
			1	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.3	$(A_r \text{ O} \times 4 =)$ $4 \times 16$ <b>or</b> 64  (percentage of oxygen =) $\frac{64}{110} \times 100$  $= 58.18$  $= 58 (\%)$		1	AO2 5.3.1.2
			1	
			1	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
<b>07.4</b>	(unit conversion) $(25 \text{ cm}^3 \div 1000) = 0.025 \text{ dm}^3$		1	AO2 5.3.2.5
	$(\text{conc} =) \frac{0.30}{0.025} \text{ (g/dm}^3\text{)}$	allow correct use of incorrect / no unit conversion	1	
	$= 12 \text{ (g/dm}^3\text{)}$		1	
<b>alternative approach:</b>  $\frac{0.30}{25} \text{ (g/cm}^3\text{) (1)}$  $= 0.012 \text{ (g/cm}^3\text{) (1)}$				
(unit conversion) $(0.012 \times 1000)$ $= 12 \text{ (g/dm}^3\text{) (1)}$	allow correct conversion of an incorrect concentration calculation			

<b>Total Question 7</b>	<b>10</b>
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