

GCSE Chemistry A (Gateway Science)
J248/03 C1-C3 and C7 Higher (Higher Tier)

Question Set 25

1 An element, X, is reacted with oxygen, O₂.

- There is one product. It is the oxide of X, X oxide.
- 4.86 g of X reacts with 3.20 g of oxygen to make 8.06 g of X oxide.

(a) (i)

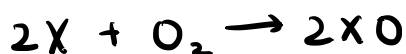
Calculate the number of moles of X, oxygen and X oxide in the reaction.

- Relative atomic mass of X = 24.3
- Relative formula masses: O₂ = 32.0; X oxide = 40.3.

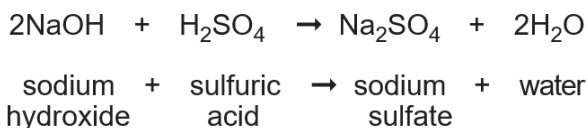
X	+ O ₂	→	X oxide	
4.86	3.20		8.06	Number of moles of X = 0.2
24.3	32.0		40.3	Number of moles of O ₂ = 0.1
0.2	0.1		0.2	Number of moles of X oxide = 0.2
2	1		2	Number of moles of X oxide = 0.2 [3]

(ii) Use your answer to (i) to write the **balanced symbol** equation for the reaction between X and oxygen to make X oxide.

[2]



(b) The equation shows the reaction between sodium hydroxide and dilute sulfuric acid.



Calculate the mass of sodium hydroxide needed to make 30.0 g of sodium sulfate.

Give your answer to 3 significant figures.

Answer = 16.9 g [3]

Total Marks for Question Set 25: 8

NaOH	Na ₂ SO ₄
16.889	30
40	142.1
0.42	0.21
2	1

The Periodic Table of the Elements

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(0)
1 H hydrogen 1.0	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	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
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 98.0	44 Ru ruthenium 101.1
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
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	115 Mc moscovium	116 Lv livermorium	117 Ts tennessine	
			118 Og oganeson				

Key
 atomic number
 Symbol
 name
 relative atomic mass

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