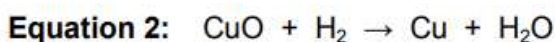
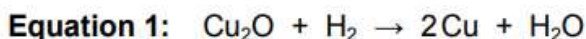


AMOUNT OF SUBSTANCE

From page 7

Q6. A teacher found that the oxide of copper produced 2.54 g of copper and 0.72 g of water. Two possible equations for the reaction are:



Determine which is the correct equation for the reaction in the teacher's experiment.

Relative atomic masses (Ar): H = 1 O = 16 Cu = 63.5

$$\text{mol Cu} = \frac{2.54}{63.5} = 0.04 \quad \checkmark$$

ratio is
1:1

$$\text{mol H}_2\text{O} = \frac{0.72}{18} = 0.04 \quad \checkmark$$

CuO
so equation 2
 \checkmark

[3 marks]

AQA June 19 H Q8.4

From page 8

Q8. A mixture contains 1.00 kg of aluminium and 3.00 kg of iron oxide.

The equation for the reaction is: $2\text{Al} + \text{Fe}_2\text{O}_3 \rightarrow 2\text{Fe} + \text{Al}_2\text{O}_3$

Show that aluminium is the limiting reactant.

Relative atomic masses (Ar): O = 16 Al = 27 Fe = 56

$$\text{mol Fe}_2\text{O}_3 = \frac{3000}{160} = 18.75 \quad \checkmark$$

Mr Fe_2O_3
 $= ((56 \times 2) + (16 \times 3))$
 $= 160 \quad \checkmark$

$$\text{mol Al} = \frac{1000}{27} = 37.0 \quad \checkmark$$

ratio 2:1 so 18.75 mol Fe_2O_3 needs \checkmark

$2 \times 18.75 \text{ mol Al} = 37.5$ so not enough

Al so is limiting reactant.

[4 marks]

AQA June 20 H Q6.2

AMOUNT OF SUBSTANCE

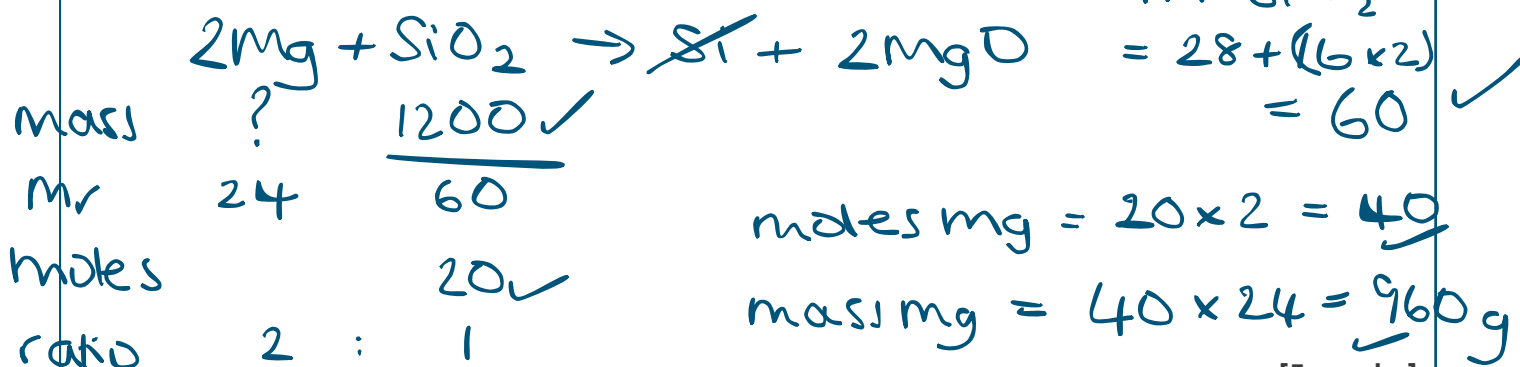
From page 8

Q10. Calculate the minimum mass in grams of magnesium needed to completely reduce 1.2 kg of silicon dioxide.

The equation is $2 \text{Mg(s)} + \text{SiO}_2\text{(s)} \rightarrow \text{Si(s)} + 2 \text{MgO(s)}$

Relative atomic masses (Ar): O = 16 Mg = 24 Si = 28

HT



[5 marks]

AQA June 22 H Q7.4

From page 9

Q12. Calculate the percentage atom economy for the production of silver iodide in this reaction. The equation for the reaction is:



$\text{AgNO}_3\text{(aq)} + \text{NaI(aq)} \rightarrow \text{AgI(s)} + \text{NaNO}_3\text{(aq)}$

Give your answer to 3 significant figures.

Relative formula masses (Mr): $\text{AgNO}_3 = 170$ $\text{NaI} = 150$ $\text{AgI} = 235$

$\text{NaNO}_3 = 85$

$\text{Mr total reactants} = 170 + 150 = 320 \text{ g}$
 $\frac{235}{320} \times 100 = 73.4375$ ✓
 $= 73.4\%$ ✓

[4 marks]

AQA June 20 H Q3.5



CONCENTRATION

From page 11

Q15. Calculate the mass of sodium hydroxide in 30.0 cm^3 of a 0.105 mol/dm^3 solution. Relative formula mass (M_r): $\text{NaOH} = 40$

$$\text{mol} = \frac{30}{1000} \times 0.105 = 0.00315 \checkmark$$

$$\text{mass} = 0.00315 \times 40 = 0.126 \text{ g} \checkmark$$

[2 marks]

AQA June 18 H Q9.5

Q16. A student made 250 cm^3 of a solution of citric acid of concentration 0.0500 mol/dm^3 . Calculate the mass of citric acid ($\text{C}_6\text{H}_8\text{O}_7$) required. Relative atomic masses (A_r): $\text{H} = 1$ $\text{C} = 12$ $\text{O} = 16$



$$\text{mol} = \frac{250}{1000} \times 0.05 = 0.0125 \checkmark$$

$$\begin{aligned} M_r \text{ citric acid} &= (6 \times 12) + (8 \times 1) + (7 \times 16) \\ &= 192 \checkmark \end{aligned}$$

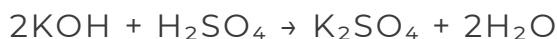
$$\text{mass} = 0.0125 \times 192 = 2.4 \text{ g}$$

[3 marks]

AQA June 20 H Q9.4



Q18. A student found that 15.5 cm^3 of 0.500 mol/dm^3 dilute sulfuric acid completely reacted with 25.0 cm^3 of potassium hydroxide solution. The equation for the reaction is:



Calculate the concentration of the potassium hydroxide solution in mol/dm^3 and in g/dm^3

Relative atomic masses (Ar): H = 1 O = 16 K = 39

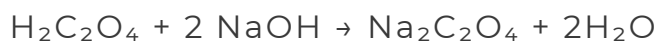
	2KOH	+	H_2SO_4		} Mr KOH $= 39 + 16 + 1$ $= 56$ 0.62×56 $= 34.7 \text{ g/dm}^3$
vol	$25/1000$		$15.5/1000$	\times	
conc			0.500		
mol	0.00775×2 $= 0.0155$		$= 0.00775$		
ratio	2		1		

Conc = $\frac{0.0155}{25/1000} = 0.62 \text{ mol/dm}^3$

[6 marks]

AQA June 19 H Q9.5

Q19. A student found that 25.0 cm^3 of the sodium hydroxide solution was neutralised by 15.00 cm^3 of the 0.0480 mol/dm^3 ethanedioic acid solution. The equation for the reaction is:



Calculate the concentration of the sodium hydroxide solution in mol/dm^3

	$\text{H}_2\text{C}_2\text{O}_4$	+	2NaOH	
vol	$15/1000$		$25/1000$	
conc	0.0480		$= 0.00144$	$\div 25/1000 = 0.0576 \text{ mol/dm}^3$
mol	0.00072 ✓		$= 0.0072 \times 2 = 0.00144$	
ratio	1	:	2	

[3 marks]

AQA June 21 H Q9.5

