

GCSE Chemistry B (Twenty First Century Science)

J258/04 Depth in chemistry (Higher Tier)

Question Set 8

1. Alex does some experiments to make some salts.

(a) In his first experiment, he uses 0.2 moles of magnesium oxide. He works out the mass of magnesium oxide in 0.2 moles.

He uses this equation:

$$\text{number of moles} = \text{mass of substance (g)} \div \text{relative formula mass (g)}$$

Use the equation and the Periodic Table to work out the mass of magnesium oxide in 0.2 moles.

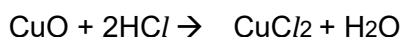
Give your answer to **1** decimal place.

[3]

Mass = g

(b) In another experiment, Alex reacts 4.0 g copper oxide with hydrochloric acid to make copper chloride. This is an equation for the reaction.

copper oxide + hydrochloric acid \rightarrow copper chloride + water



Alex works out the mass of copper chloride he can make in the experiment.

He uses these relative formula masses.

Name of compound	Formula	Relative formula mass
copper oxide	CuO	79.5
copper chloride	CuCl ₂	134.5

What mass of copper chloride can be made from 4.0 g of copper oxide?

Use the relative formula masses and the equation to help you.

Give your answer to **2** decimal places.

Mass = g [4]

(c) Alex adds 4.0 g of solid copper oxide to 25.0 cm³ dilute hydrochloric acid.

At the end of the experiment, Alex sees that there is a problem because he has some unreacted solid left.

(i) How will this problem affect his actual yield? [1]

(ii) How could Alex change his experiment to solve this problem? [1]

Total Marks for Question Set 8: 9

Resource Materials

The Periodic Table of the Elements

(1)	(2)											(3)	(4)	(5)	(6)	(7)	(8)	
1 H hydrogen 1.0																		18 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	27 Co cobalt 58.9	28 Ni nickel 58.7	29 Cu copper 63.5	30 Zn zinc 65.4	31 Ga gallium 69.7	32 Ge germanium 72.6	33 As arsenic 74.9	34 Se selenium 79.0	35 Br bromine 79.9	36 Kr krypton 83.8	
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	44 Ru ruthenium 101.1	45 Rh rhodium 102.9	46 Pd palladium 106.4	47 Ag silver 107.9	48 Cd cadmium 112.4	49 In indium 114.8	50 Sn tin 118.7	51 Sb antimony 121.8	52 Te tellurium 127.6	53 I iodine 126.9	54 Xe xenon 131.3	
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	77 Ir iridium 192.2	78 Pt platinum 195.1	79 Au gold 197.0	80 Hg mercury 200.6	81 Tl thallium 204.4	82 Pb lead 207.2	83 Bi bismuth 209.0	84 Po polonium	85 At astatine	86 Rn radon	
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		116 Lv livermorium			

<p>Key</p> <p>atomic number</p> <p>Symbol</p> <p>name</p> <p>relative atomic mass</p>
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