Combined Science - Chemistry - Key Stage 4
Atomic Structure & the Periodic Table

Chemical formulae and conservation of mass

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Periodic Table of Elements

Key:

relative atomic mass → 1
Name → H (Atomic symbol)
hydrogen
1 (Atomic (proton number))

| 1 H hydrogen 1																	4 He helium 2
7 Li lithium 3	9 Be beryllium 4											11 B boron 5	12 C carbon 6	14 N nitrogen 7	16 O oxygen 8	19 F fluorine 9	20 Ne neon 10
23 Na sodium 11	24 Mg magnesium 12											27 Al aluminium 13	28 Si silicon 14	31 P phosphorus 15	32 S sulfur 16	35.5 Cl chlorine 17	40 Ar argon 18
39 K potassium 19	40 Ca calcium 20	45 Sc scandium 21	48 Ti titanium 22	51 V vanadium 23	52 Cr chromium 24	55 Mn manganese 25	56 Fe iron 26	59 Co cobalt 27	59 Ni nickel 28	63.5 Cu copper 29	65 Zn zinc 30	70 Ga gallium 31	73 Ge germanium 32	75 As arsenic 33	79 Se selenium 34	80 Br bromine 35	84 Kr krypton 36
85 Rb rubidium 37	88 Sr strontium 38	89 Y yttrium 39	91 Zr zirconium 40	93 Nb niobium 41	96 Mo molybdenum 42	[97] Tc technetium 43	101 Ru ruthenium 44	103 Rh rhodium 45	106 Pd palladium 46	108 Ag silver 47	112 Cd cadmium 48	115 In indium 49	119 Sn tin 50	122 Sb antimony 51	128 Te tellurium 52	127 I iodine 53	131 Xe xenon 54
133 Cs caesium 55	137 Ba barium 56	139 La* lanthanum 57	178 Hf hafnium 72	181 Ta tantalum 73	184 W tungsten 74	186 Re rhenium 75	190 Os osmium 76	192 Ir iridium 77	195 Pt platinum 78	197 Au gold 79	201 Hg mercury 80	204 Tl thallium 81	207 Pb lead 82	209 Bi bismuth 83	[209] Po polonium 84	[210] At astatine 85	[222] Rn radon 86
[223] Fr francium 87	[226] Ra radium 88	[227] Ac* actinium 89	[267] Rf rutherfordium 104	[270] Db dubnium 105	[269] Sg seaborgium 106	[270] Bh bohrium 107	[270] Hs hassium 108	[278] Mt meitnerium 109	[281] Ds darmstadtium 110	[281] Rg roentgenium 87	[285] Cn copemicium 112	[286] Nh nihonium 113	[289] Fl flerovium 114	[289] Mc moscovium 115	[293] Lv livermorium 116	[293] Ts tennessine 117	[294] Og organesson 118

Independent practice: Copy and complete the table

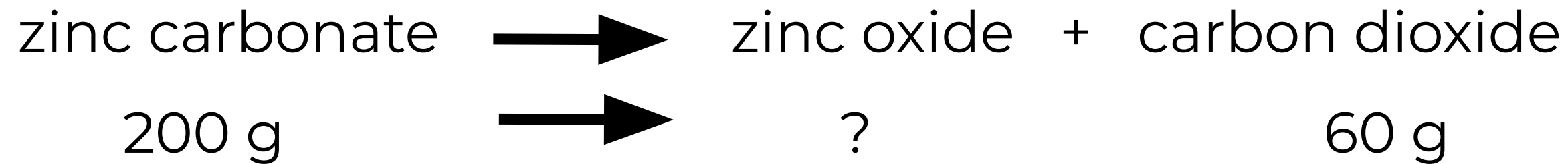| Compound Name	Number atoms of each element	Total number of atoms	Chemical Formula
Magnesium chloride	1 Magnesium, 2 chlorine	3	$MgCl_2$
	1 Sodium, 1 fluorine		
	2 potassium, 1 oxygen		
		5	$CuCO_3$
	3 Lithium, 1 Nitrogen		
Carbon monoxide			CO
sodium hydrogen carbonate			$NaHCO_3$
Aluminium chloride	1 aluminium 3 chloride	4	
Calcium chloride			$CaCl_2$

Independent practice

1. What is meant by the term conservation of mass?

2. A student says that oxygen gas doesn't have a mass. Is the student correct?

3. Calculate the unknown mass in the following reaction.

$$Mg + 2HCl \longrightarrow MgCl_2 + H_2$$

24 g   73 g   ?   2 g
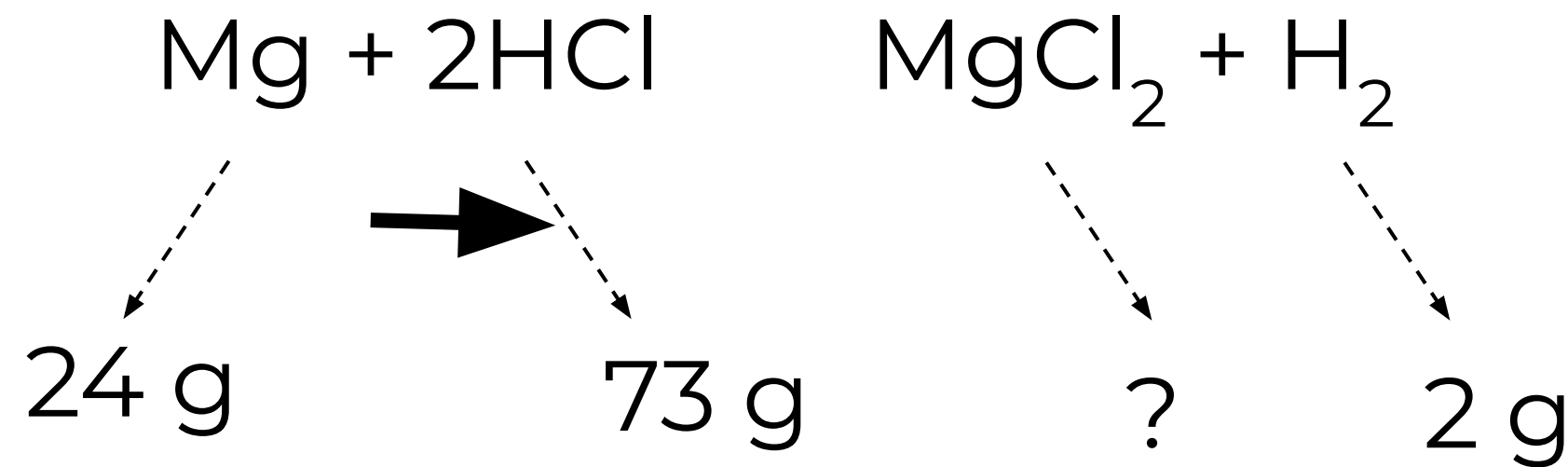
Independent task

Zinc oxide is made by heating zinc carbonate.

zinc carbonate ➡ zinc oxide + carbon dioxide

200 g ➡ ? 60 g

(a) 60 grams of carbon dioxide is produced when 200 grams of zinc carbonate is heated.

Calculate the mass of zinc oxide produced when 200 grams of zinc carbonate is heated.
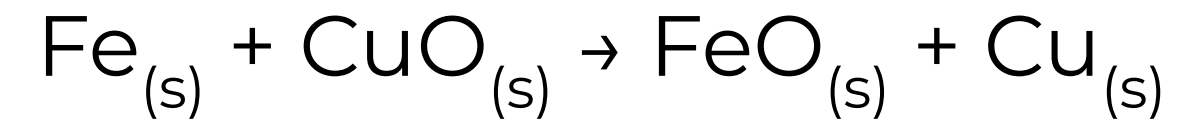
_____

mass _____ g

(1)

Independent task

The equation for the reaction between zinc and copper oxide is:

$$Fe_{(s)} + CuO_{(s)} \rightarrow FeO_{(s)} + Cu_{(s)}$$

1.50 g of iron fully reacted with 1.72 g of copper oxide to produce 1.92 g of iron oxide.

What mass of copper was produced?

_____

_____

Mass of copper produced = _____ g   (1)