

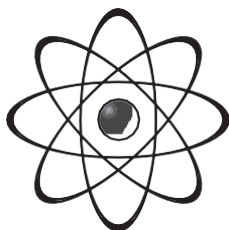
GCSE Chemistry B (Twenty First Century Science)
J258/01 Breadth in Chemistry (Foundation Tier)

Question Set 20

1

Dalton was one of the first scientists to model the atom.

Rutherford later developed an improved model of the atom from experiments.



Rutherford's model describes:

- a small positive nucleus
- the nucleus surrounded by empty space
- negatively charged particles orbiting in this empty space.

(a) Describe how Dalton's model of the atom was different to Rutherford's.

[1]

(b) Name the 'negatively charged particles' in Rutherford's model.

[1]

(c) We currently know that the nucleus of an atom contains protons and neutrons.

Complete the table by filling in the blank spaces.

	Relative Charge	Relative Mass
Proton	+1	1
Neutron		

[2]

(d) The table shows the number of protons and neutrons in a sodium atom.

Complete the table by filling in the blank spaces.

	Atomic number	Protons	Mass number	Neutrons
Sodium	11	11	23	12
Fluorine	9		19	

[2]

- (e) Kai finds some information on the internet.

	Approximate size (m)
Hydrogen atom	5.3×10^{-11}
Hydrogen molecule	2.9×10^{-10}
Oxygen molecule	3.5×10^{-10}
Proton	8.7×10^{-16}
Xenon atom	1.1×10^{-10}

Table 1.1

Kai writes some notes:

- 1 Atoms are smaller than molecules.
- 2 Atoms are smaller than protons.

Is Kai correct?

Use the information in **Table 1.1** to explain your answer.

[2]

Total Marks for Question Set 20: 8

Resource Materials

Question Set No: 20

The Periodic Table of the Elements

(1)	(2)											(3)	(4)	(5)	(6)	(7)	(0)	
1 1 H hydrogen 1.0																		18 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	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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