



Cambridge IGCSE™

COMBINED SCIENCE

0653/11

Paper 1 Multiple Choice (Core)

May/June 2024

45 minutes

You must answer on the multiple choice answer sheet.

You will need: Multiple choice answer sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

INSTRUCTIONS

- There are **forty** questions on this paper. Answer **all** questions.
- For each question there are four possible answers **A**, **B**, **C** and **D**. Choose the **one** you consider correct and record your choice in soft pencil on the multiple choice answer sheet.
- Follow the instructions on the multiple choice answer sheet.
- Write in soft pencil.
- Write your name, centre number and candidate number on the multiple choice answer sheet in the spaces provided unless this has been done for you.
- Do **not** use correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.

INFORMATION

- The total mark for this paper is 40.
- Each correct answer will score one mark.
- Any rough working should be done on this question paper.
- The Periodic Table is printed in the question paper.

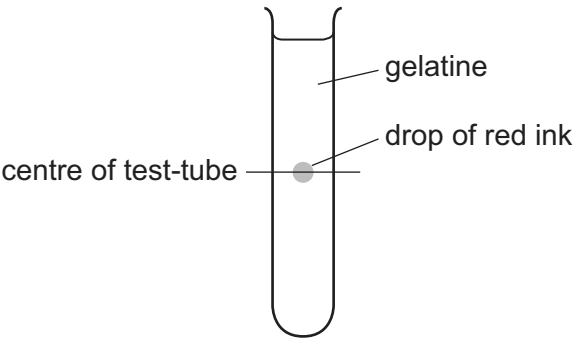
This document has **16** pages.



2

- 1 Which characteristic of living organisms is the removal of substances in excess of requirements?
- A excretion
 - B nutrition
 - C reproduction
 - D respiration
- 2 A drop of red ink is injected into the centre of a test-tube containing gelatine. Gelatine is a clear substance that allows ink particles to diffuse through it.

The diagram shows the test-tube at the start of the experiment.



Which diagram correctly shows the appearance of the test-tube after a period of time?

A

B

C

D

key

area containing red ink

- 3 Glycogen, protein and starch are large molecules.
- Which row correctly names the smaller molecules that combine to produce these large molecules?

	large molecules		
	glycogen	protein	starch
A	glucose	amino acids	glucose
B	glucose	amino acids	glycerol
C	glycerol	fatty acids	glycerol
D	glycerol	fatty acids	glucose

3

4 Which statement about enzymes is correct?

- A** Enzyme activity always continues to increase as the temperature increases.
- B** Enzyme activity is **not** affected by pH.
- C** Enzymes are biological catalysts.
- D** Enzymes are proteins that always slow down reactions.

5 Vegetarians do **not** eat meat.

Which nutrient in meat do vegetarians need to get from other kinds of food?

- A** fibre
- B** protein
- C** starch
- D** vitamin C

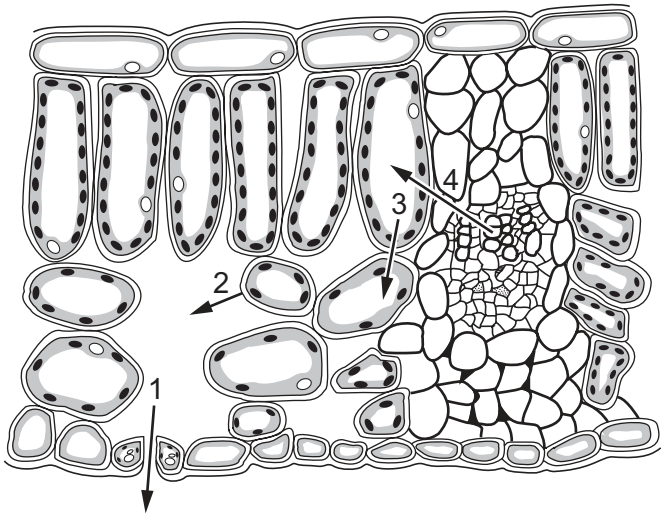
6 Chemical digestion occurs in the alimentary canal so that molecules can be absorbed.

Which type of molecules are absorbed?

- A** large insoluble molecules
- B** large soluble molecules
- C** small insoluble molecules
- D** small soluble molecules

4

7 The diagram shows a section through a leaf. The arrows represent the movement of water by diffusion, evaporation or osmosis.



Which arrows represent diffusion and evaporation?

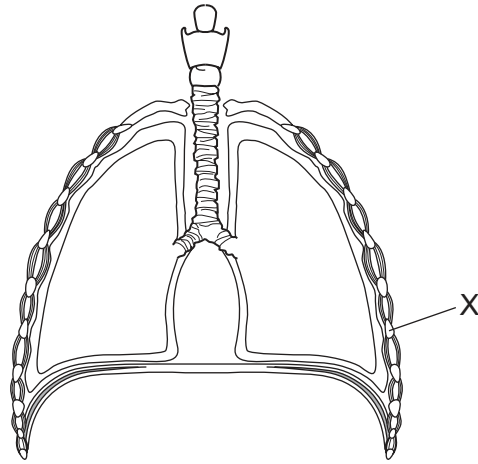
	diffusion	evaporation
A	1	2
B	2	3
C	3	4
D	4	1

8 Which row is correct for inspired air when it is compared to expired air?

	oxygen	carbon dioxide	water vapour
A	higher	lower	higher
B	higher	lower	lower
C	lower	higher	lower
D	lower	higher	higher

5

9 The diagram shows the human gas exchange system.



Which part of the gas exchange system is labelled X?

- A** bronchus
- B** diaphragm
- C** rib
- D** trachea

10 The table shows some data about a student.

pupil size in eye	pulse rate /beats per minute
	68

The student is frightened by a sudden loud noise.

Which row shows the results immediately after the loud noise?

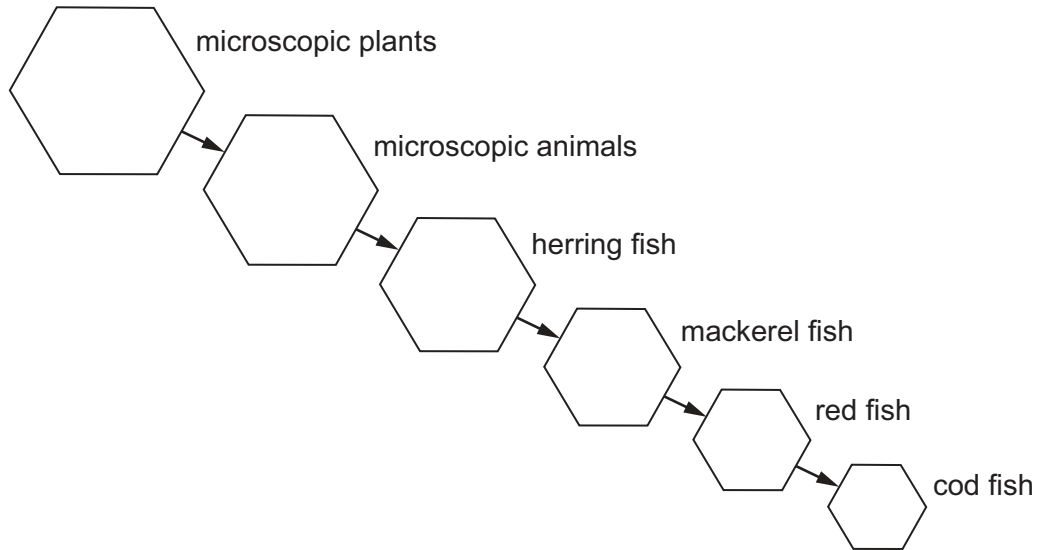
	pupil size in eye	pulse rate /beats per minute
A		60
B		80
C		60
D		80

11 Which row is correct for asexual reproduction?

	genetically identical offspring	fusion of nuclei	number of parents
A	no	yes	two
B	yes	no	one
C	no	yes	one
D	yes	no	two

7

12 The diagram represents a food chain found in the sea.

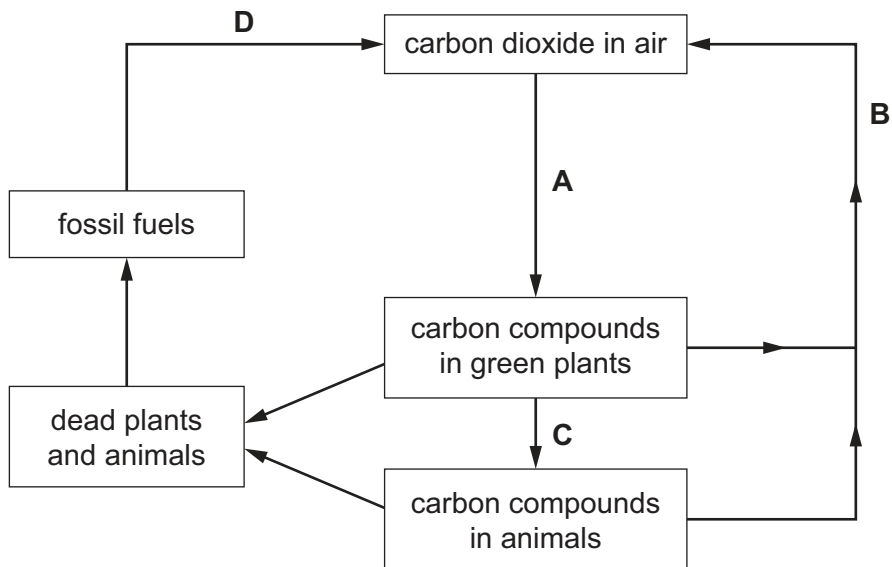


How many consumer levels are there?

- A** 1 **B** 4 **C** 5 **D** 6

13 The diagram shows part of the carbon cycle.

Which arrow represents combustion?



14 A fixed mass of argon gas in a sealed container is heated.

The pressure inside the container increases.

Which statement explains why the pressure increases?

- A** There is an increase in the number of gaseous particles inside the container.
- B** There is an increase in the number of collisions per second between the particles of gas and the walls of the container.
- C** The particles of gas have less energy and collide with the wall of the container more frequently.
- D** There is a decrease in the space that the particles have to move in.

15 Which processes are physical changes?

- 1 burning methane gas
- 2 dissolving sugar in water
- 3 evaporating ethanol
- 4 melting an ice cube
- 5 rusting of iron

- A** 1, 3 and 4 **B** 1, 4 and 5 **C** 2, 3 and 4 **D** 2, 3 and 5

16 The nucleon number (mass number) is the total number of1..... and2..... in the nucleus of an atom.

Which words complete this sentence?

	1	2
A	protons	neutrons
B	protons	electrons
C	neutrons	electrons
D	neutrons	shells

17 Sodium chloride is represented by NaCl .

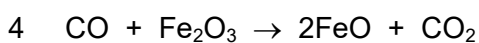
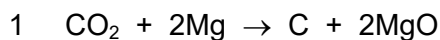
What is this representation called?

- A** a dot-and-cross diagram
- B** an equation
- C** a formula
- D** a symbol

18 What is observed when molten lead(II) bromide is electrolysed using inert electrodes?

- A** Bubbles of a brown gas appear at the anode.
- B** Bubbles of colourless gases appear at both electrodes.
- C** Bubbles of a colourless gas appear at the cathode only.
- D** No gas bubbles are observed at either electrode.

19 Four equations for reactions involving oxidation and reduction are listed.



Which statement is correct?

- A** In reaction 1, the Mg is being reduced.
- B** In reaction 2, the PbO is being oxidised.
- C** In reaction 3, the CuO is being oxidised.
- D** In reaction 4, the Fe_2O_3 is being reduced.

20 A mixture of ammonium carbonate and ammonium chloride is heated with aqueous sodium hydroxide.

Which gas is produced?

- A** ammonia
- B** carbon dioxide
- C** chlorine
- D** hydrogen chloride

21 An atom of an element in the Periodic Table has the electronic structure 2,8,8.

What is the group number of this element?

- A** I **B** III **C** VII **D** VIII

22 Which property is the same for sodium and copper?

- A colour
- B density at room temperature
- C melting point
- D state at room temperature

23 Three properties of element X are listed.

- X reacts with dilute hydrochloric acid to make hydrogen.
- X is formed when carbon is heated with an oxide of X.
- X does not react with water.

What is the position of X in the reactivity series?

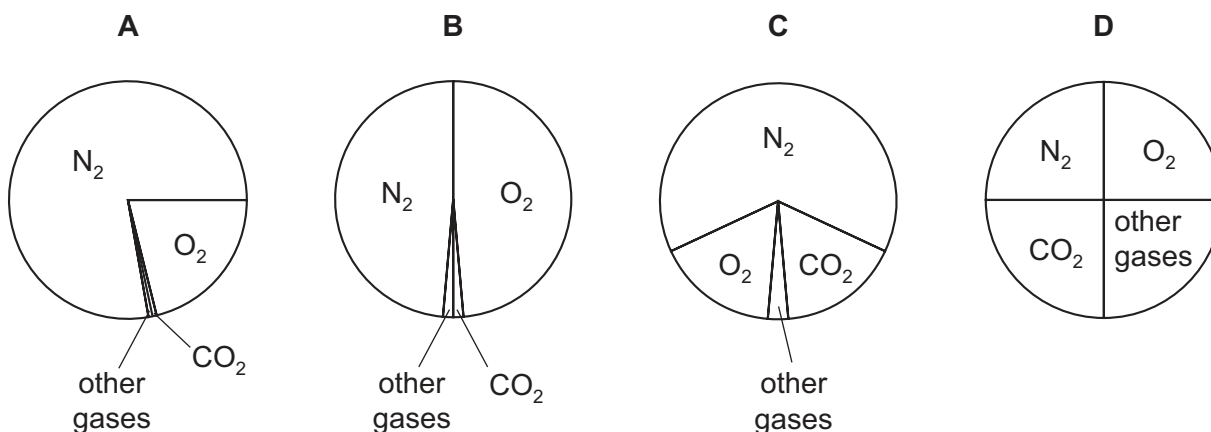
- A It is above sodium.
- B It is below copper.
- C It is below zinc but above copper.
- D It is between calcium and zinc.

24 Which processes are used in water treatment?

- 1 chlorination
- 2 cracking
- 3 filtration

- A 1, 2 and 3 B 1 and 2 only C 1 and 3 only D 2 and 3 only

25 Which pie chart shows the proportions of gases in clean air?



26 Which fraction obtained from petroleum by fractional distillation is used for making chemicals?

- A** bitumen
- B** gasoline
- C** naphtha
- D** refinery gas

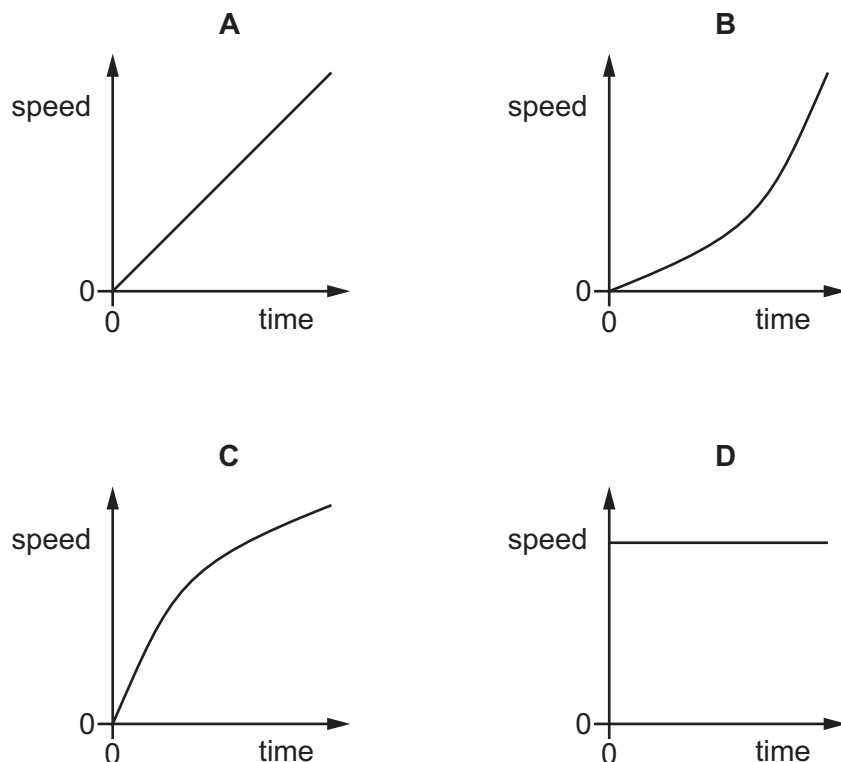
27 Which row about alkanes is correct?

	type of hydrocarbon	products of complete combustion
A	saturated	carbon dioxide and hydrogen
B	saturated	carbon dioxide and water
C	unsaturated	carbon dioxide and hydrogen
D	unsaturated	carbon dioxide and water

28 Which row shows apparatus used to measure length, time and volume?

	length	time	volume
A	measuring cylinder	metre rule	stop-clock
B	measuring cylinder	stop-clock	metre rule
C	metre rule	measuring cylinder	stop-clock
D	metre rule	stop-clock	measuring cylinder

29 Which speed–time graph represents the motion of an object that is moving with constant speed?



30 Samples of three liquids, X, Y and Z, each have a volume of 16 cm^3 .

The mass of each sample is shown.

sample of liquid	mass / g
X	13
Y	16
Z	19

Which liquids have a density less than 1.1 g/cm^3 ?

- A** X and Y **B** X only **C** Y and Z **D** Z only

31 Which object has a resultant force acting on it?

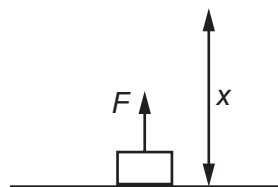
- A** an object moving at constant speed along a curved path
B an object moving at constant speed along a straight path
C an object moving at constant speed vertically upwards
D an object that is stationary

- 32** In three experiments, equal forces of magnitude F move the same block of wood through equal distances x .

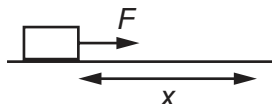
In experiment 1, the block is raised vertically.

In experiment 2, the block is moved horizontally.

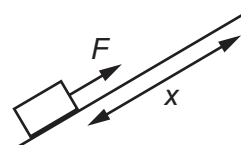
In experiment 3, the block is moved along a sloping board.



experiment 1



experiment 2



experiment 3

In each experiment, the block is moved at constant speed.

Which statement about the work done by the force in the experiments is correct?

- A** The most work is done in experiment 1.
 - B** The most work is done in experiment 2.
 - C** The most work is done in experiment 3.
 - D** The work done is the same in experiments 1, 2 and 3.
- 33** In which situation is energy **not** being transferred?
- A** a book resting on a shelf
 - B** an electric current lighting a lamp
 - C** an electric kettle heating water
 - D** sound travelling through air
- 34** The temperature of a gas increases.

What happens to the molecules of the gas?

- A** Their average speed decreases.
- B** Their average speed increases.
- C** They contract.
- D** They expand.

14

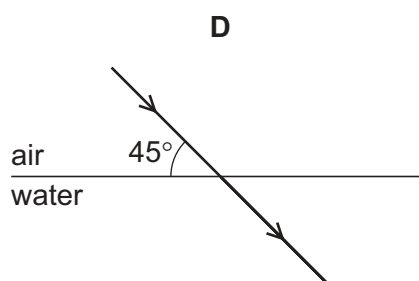
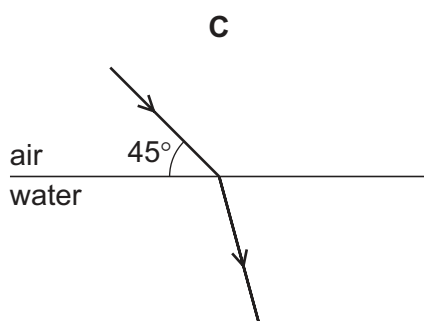
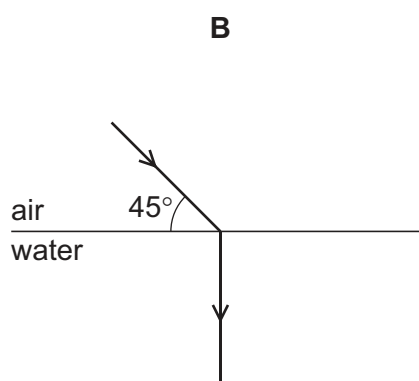
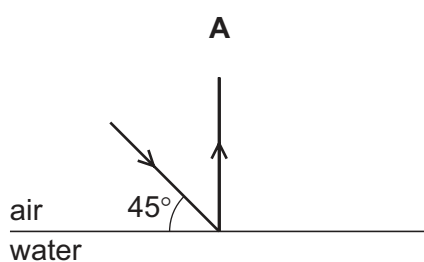
35 Energy is transferred from the Sun to the Earth through the vacuum of space.

Which method of energy transfer is involved?

- A** conduction
- B** convection
- C** evaporation
- D** radiation

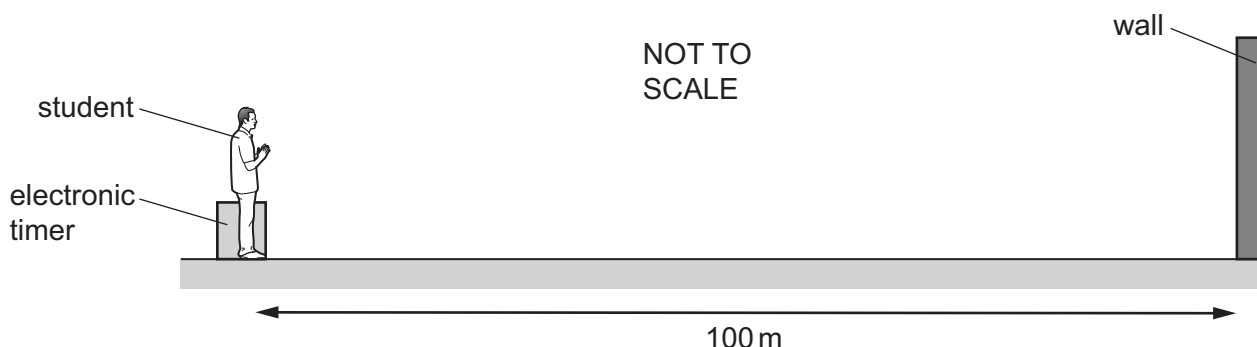
36 A ray of light in air strikes the surface of water at an angle of 45° .

Which diagram shows what happens to the ray after it strikes the surface?



15

- 37 A student measures the speed of sound. He claps his hands and the sound reflects back from a wall that is 100 m away from him.



An electronic timer next to the student detects the echo of the sound 0.60 s after the sound is made.

Which calculation gives the speed of sound?

- A $\frac{200}{0.30}$ m/s B $\frac{200}{0.60}$ m/s C $\frac{100}{0.60}$ m/s D $\frac{100}{1.2}$ m/s
- 38 A resistor has a resistance of $4.5\ \Omega$. The resistor is connected to a cell and there is a current of 0.60 A in the resistor.

What is the potential difference (p.d.) across the resistor?

- A 0.13 V B 2.7 V C 5.1 V D 7.5 V
- 39 Why are electrical devices **not** used near a sink containing hot water?
- A Hot water causes overheating in the cables.
 B Hot water causes the fuse to blow.
 C Water damages the insulation around the cables.
 D Water conducts electricity and can cause an electric shock.
- 40 A 240 V power supply produces a current of 8.0 A in a heater that has a resistance of $30\ \Omega$. The power transferred in the heater is 1.9 kW.

What is the rating of an appropriate fuse for the circuit?

- A 10 A B 2.0 kW C 1.8 kW D $30\ \Omega$

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The Periodic Table of Elements

Group																			
I	II											III	IV	V	VI	VII	VIII		
		1 Hhydrogen1																	
		Key atomic number atomic symbol name relative atomic mass																	
3 Li lithium 7	4 Be beryllium 9													5 B boron 11	6 C carbon 12	7 N nitrogen 14	8 O oxygen 16	9 F fluorine 19	10 Ne neon 20
11 Na sodium 23	12 Mg magnesium 24													13 Al aluminium 27	14 Si silicon 28	15 P phosphorus 31	16 S sulfur 32	17 Cl chlorine 35.5	18 Ar argon 40
19 K potassium 39	20 Ca calcium 40	21 Sc scandium 45	22 Ti titanium 48	23 V vanadium 51	24 Cr chromium 52	25 Mn manganese 55	26 Fe iron 56	27 Co cobalt 59	28 Ni nickel 59	29 Cu copper 64	30 Zn zinc 65	31 Ga gallium 70	32 Ge germanium 73	33 As arsenic 75	34 Se selenium 79	35 Br bromine 80	36 Kr krypton 84		
37 Rb rubidium 85	38 Sr strontium 88	39 Y yttrium 89	40 Zr zirconium 91	41 Nb niobium 93	42 Mo molybdenum 96	43 Tc technetium —	44 Ru ruthenium 101	45 Rh rhodium 103	46 Pd palladium 106	47 Ag silver 108	48 Cd cadmium 112	49 In indium 115	50 Sn tin 119	51 Sb antimony 122	52 Te tellurium 128	53 I iodine 127	54 Xe xenon 131		
55 Cs caesium 133	56 Ba barium 137	57–71 lanthanoids	72 Hf hafnium 178	73 Ta tantalum 181	74 W tungsten 184	75 Re rhenium 186	76 Os osmium 190	77 Ir iridium 192	78 Pt platinum 195	79 Au gold 197	80 Hg mercury 201	81 Tl thallium 204	82 Pb lead 207	83 Bi bismuth 209	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 —	113 Nh nihonium —	114 Fl flerovium —	115 Mc moscovium —	116 Lv livermorium —	117 Ts tennessine —	118 Og oganeson —		

lanthanoids	57 La lanthanum 139	58 Ce cerium 140	59 Pr praseodymium 141	60 Nd neodymium 144	61 Pm promethium —	62 Sm samarium 150	63 Eu europium 152	64 Gd gadolinium 157	65 Tb terbium 159	66 Dy dysprosium 163	67 Ho holmium 165	68 Er erbium 167	69 Tm thulium 169	70 Yb ytterbium 173	71 Lu lutetium 175
	89 Ac actinium —	90 Th thorium 232	91 Pa protactinium 231	92 U uranium 238	93 Np neptunium —	94 Pu plutonium —	95 Am americium —	96 Cm curium —	97 Bk berkelium —	98 Cf californium —	99 Es einsteinium —	100 Fm fermium —	101 Md mendelevium —	102 No nobelium —	103 Lr lawrencium —

The volume of one mole of any gas is 24 dm³ at room temperature and pressure (r.t.p.).