Cambridge Assessment International Education

Cambridge IGCSE™

COMBINED SCIENCE **0653/11**

Paper 1 Multiple Choice (Core) **May/June 2023**

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. Any blank pages are indicated.

IB23 06_0653_11/2RP

1 Which characteristic of living organisms involves chemical reactions in cells that break down nutrient molecules and release energy?

A excretion

B nutrition

C respiration

D sensitivity

2 Which structures are present in an animal cell?

	cell membrane	cell wall	cytoplasm	nucleus
A	✓	✗	✓	✓
B	✓	✓	✗	✓
C	✓	✗	✗	✓
D	✗	✓	✓	✗

key
✓= present
✗= not present

3 The table shows the results of tests carried out on a sample of food.

test	result
Benedict's	orange
iodine	brown
biuret	purple

Which nutrients are in the food?

A protein, reducing sugar and starch

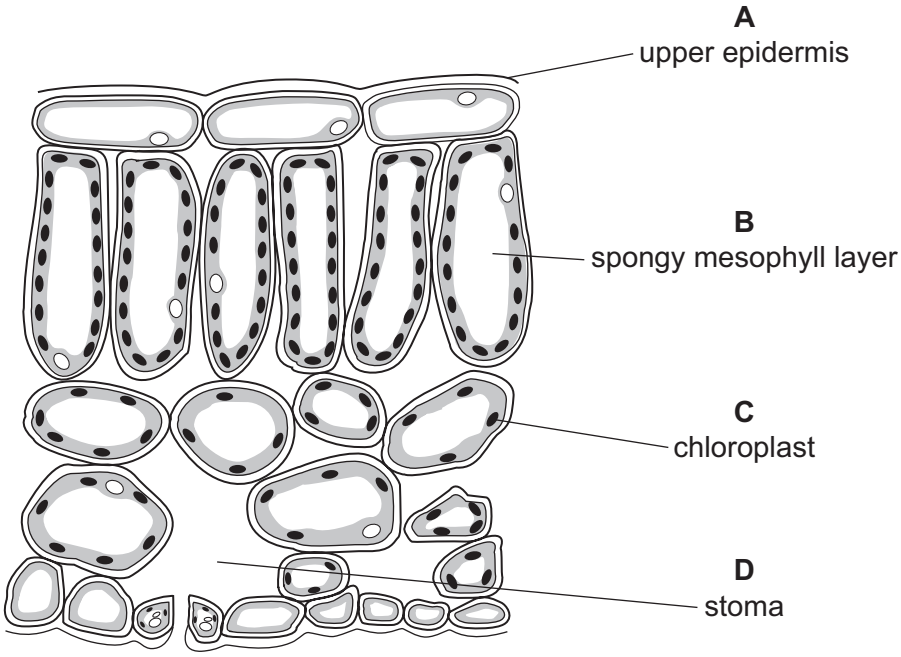
B protein and reducing sugar only

C protein and starch only

D reducing sugar and starch only

4 The diagram shows a section through part of a leaf.

Which label is correct?



5 What is the purpose of chemical digestion?

A to absorb minerals including calcium and iron

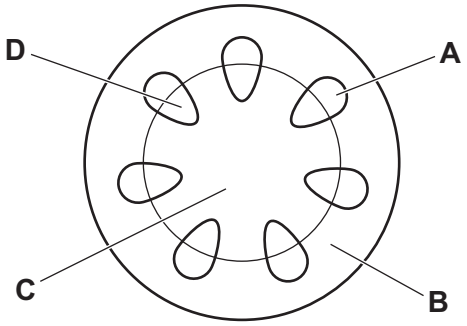
B to pass food out as faeces

C to break down large nutrient molecules into smaller molecules

D to secrete enzymes

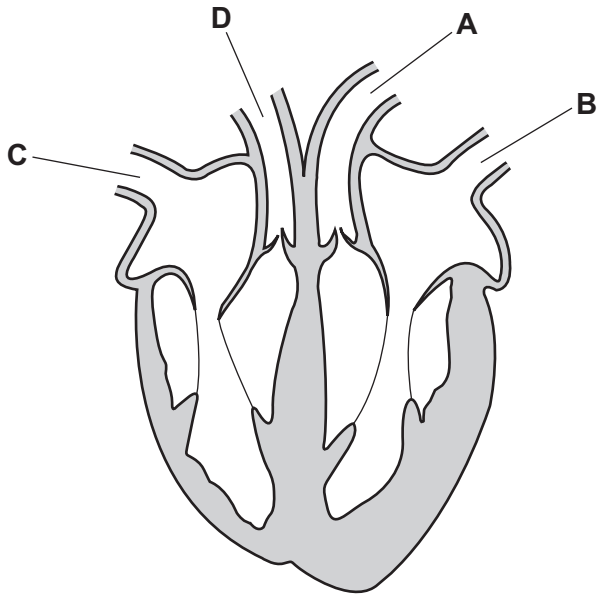
6 The diagram shows a cross-section through a plant stem.

Which labelled part is the xylem?



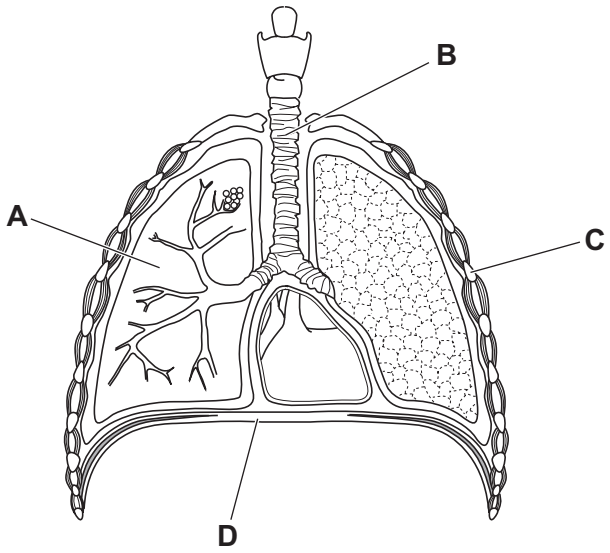
7 The diagram shows a section through the heart.

Which vessel is the pulmonary vein?



8 The diagram shows the human gas exchange system.

Which labelled part is the lung?



9 What is the word equation for aerobic respiration?

A carbon dioxide + glucose → oxygen + water

B carbon dioxide + water → glucose + oxygen

C glucose + water → carbon dioxide + oxygen

D glucose + oxygen → carbon dioxide + water

10 What are features of sexual reproduction?

	fusion of nuclei	nature of offspring
A	no	genetically different
B	yes	genetically identical
C	no	genetically identical
D	yes	genetically different

11 Which structure in a flower produces pollen?

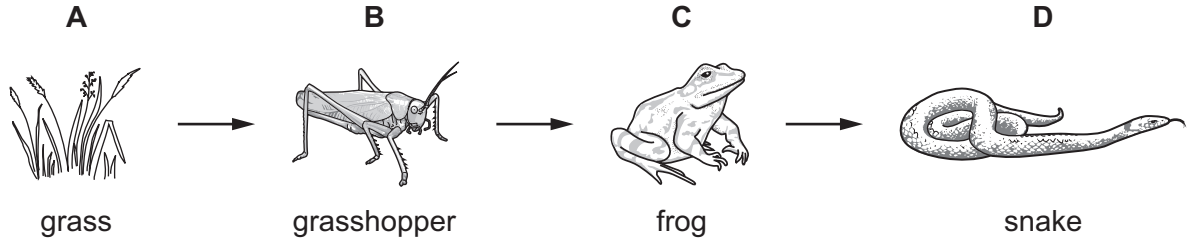
A sepal

B stamen

C stigma

D style

12 What is the primary consumer in the food chain shown?



13 What is an effect of deforestation on the environment?

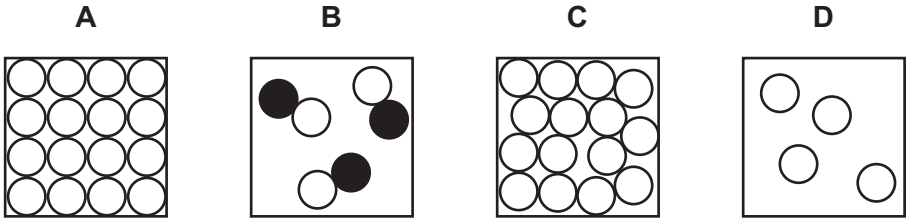
A increased carbon dioxide in the atmosphere

B improved soil condition

C reduced levels of flooding

D increased variety of animals in the area

14 Which diagram represents particles in a gaseous element?



15 What is the relative mass of a proton and the relative charge on a proton?

	relative mass	relative charge
A	0.0005	+1
B	0.0005	–1
C	1	–1
D	1	+1

16 Sodium reacts with chlorine to form sodium chloride.

Which statement describes a change that occurs during this reaction?

A Each chlorine atom loses one proton.

B Each sodium atom loses one electron.

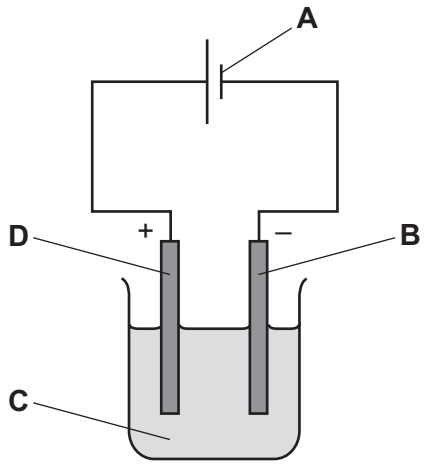
C The mass number of each chlorine atom increases.

D The atomic number of sodium decreases.

17 Which row shows the formula of sulfuric acid and the number of different elements it contains?

	formula	number of elements
A	H_2SO_3	3
B	H_2SO_3	6
C	H_2SO_4	3
D	H_2SO_4	7

18 Which label identifies the cathode in the electrolysis experiment shown?



19 Which reactions are exothermic?

1 a reaction that gets cooler

2 a reaction that gives out energy

3 a reaction that takes in energy

4 the combustion of methane

A 1 and 2 **B** 1 and 3 **C** 2 and 4 **D** 3 and 4

20 In which chemical reaction is copper reduced?

A anhydrous copper sulfate + water → hydrated copper sulfate

B copper carbonate + hydrochloric acid → copper chloride + water + carbon dioxide

C copper oxide + hydrogen → copper + water

D copper + oxygen → copper oxide

21 Dilute hydrochloric acid is tested with universal indicator and with calcium carbonate.

Which row shows the pH and describes the reaction with calcium carbonate?

	pH	reaction with calcium carbonate
A	2	a colourless gas is given off
B	2	no reaction
C	10	a colourless gas is given off
D	10	no reaction

22 The results of two tests on a solution of substance R are shown.

test	result
aqueous sodium hydroxide added	red-brown precipitate formed, insoluble in excess
dilute nitric acid added followed by aqueous silver nitrate added	white precipitate formed

What is R?

A iron(II) carbonate

B iron(III) carbonate

C iron(II) chloride

D iron(III) chloride

23 Which statement about Period 2 of the Periodic Table is correct?

A All the elements are non-metals.

B There is a change from metal to non-metal, going from left to right.

C There is a change from non-metal to metal, going from left to right.

D Most of the elements are metals.

24 Cobalt is a transition element.

What is a property of cobalt?

A It often acts as a catalyst.

B It forms white compounds.

C It has a low density.

D It is more reactive than Group I metals.

25 Copper oxide and excess carbon are mixed together.

The mass before heating is 12.2 g.

The mixture is heated strongly and allowed to cool.

The mass after heating is 10.4 g.

Why does the mass change?

A Carbon forms carbon dioxide which then combines with the copper oxide.

B Carbon reduces the copper oxide and leaves the test-tube as carbon dioxide.

C Copper oxide loses oxygen, turns into copper and the carbon remains unchanged.

D Carbon oxidises the copper oxide and leaves the test-tube as carbon dioxide.

26 Water is added separately to anhydrous copper(II) sulfate and to anhydrous cobalt(II) chloride.

Which row shows the colour changes that occur?

	copper(II) sulfate	cobalt(II) chloride
A	blue to white	blue to pink
B	blue to white	pink to blue
C	white to blue	blue to pink
D	white to blue	pink to blue

27 What is produced when propane, a hydrocarbon, undergoes complete combustion?

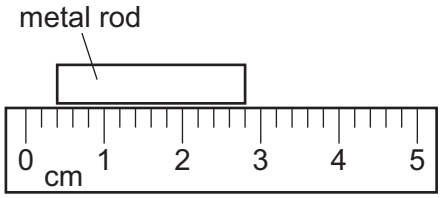
A carbon dioxide and water

B carbon dioxide only

C carbon monoxide and water

D carbon monoxide only

28 The diagram shows a metal rod placed next to a 5 cm scale.

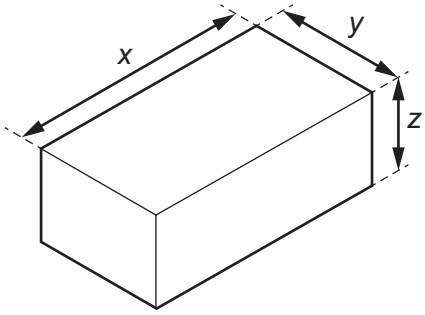


What is the length of the rod?

A 2.2 cm **B** 2.4 cm **C** 2.7 cm **D** 2.8 cm

29 A solid cuboid block of metal has density ρ.

The diagram shows its dimensions.

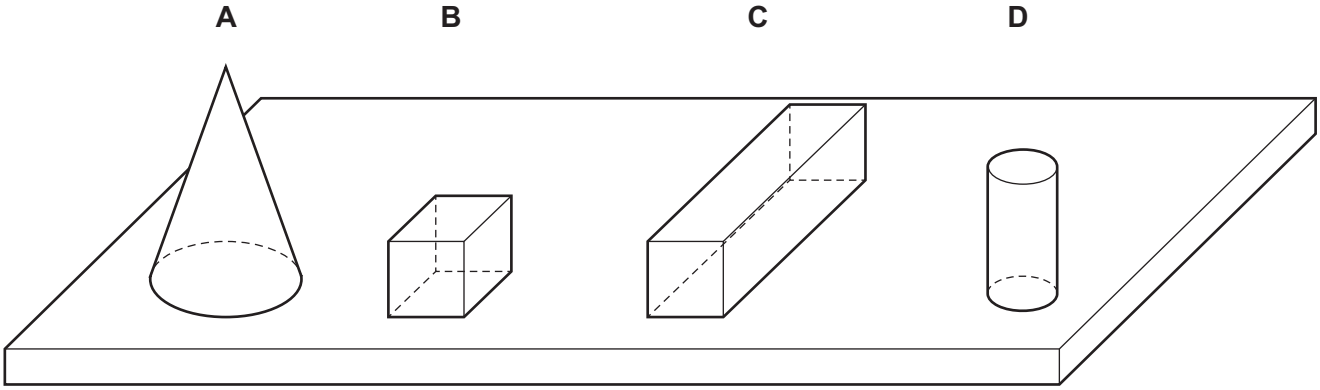


Which expression is used to calculate the mass of the block?

A $\frac{\rho}{xy}$ **B** $\frac{\rho}{xyz}$ **C** ρxy **D** ρxyz

30 Four solid objects are placed on a horizontal bench. They all have the same weight and they are drawn to the same scale.

Which object exerts the greatest pressure on the bench?



31 Which list of sources of energy contains non-renewable sources only?

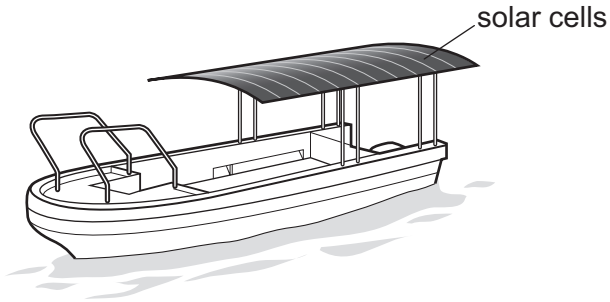
A natural gas, nuclear fission and petroleum

B natural gas, nuclear fission and wind

C natural gas, petroleum and wind

D nuclear fission, petroleum and wind

32 Solar cells mounted on a boat produce electrical energy to power the motor.



Which resource does this energy come from?

A hydroelectric energy

B light energy

C tidal energy

D wind energy

33 The molecules in a liquid are close together.

What are other features of the molecules in a liquid?

A They are arranged in a regular pattern but change positions with each other.

B They are arranged in a regular pattern and vibrate about fixed positions.

C They are arranged randomly and change positions with each other.

D They are arranged randomly and vibrate about fixed positions.

34 What is the melting point of ice and what is the boiling point of water?

	melting point / °C	boiling point / °C
A	–10	110
B	0	100
C	100	0
D	110	–10

35 Which substance is the best conductor of thermal energy?

A iron

B rubber

C water

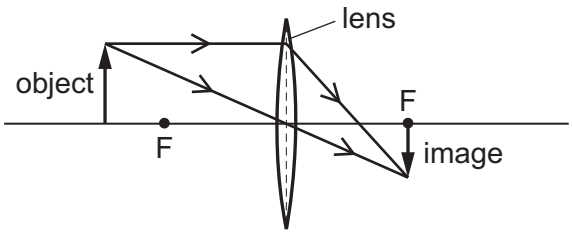
D wood

36 A thin converging lens forms a real image of an object.

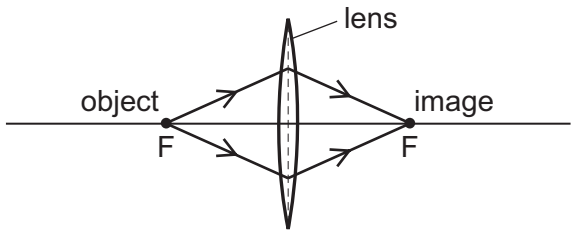
In the diagrams, each point labelled F is a principal focus of the lens.

Which diagram shows how the real image of the object is formed?

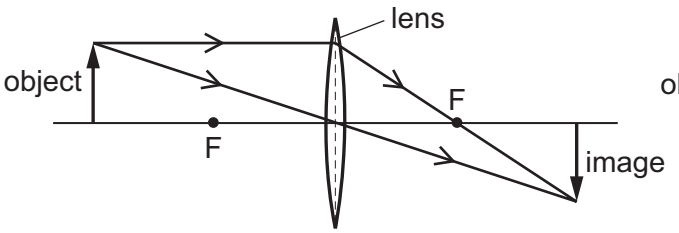
A



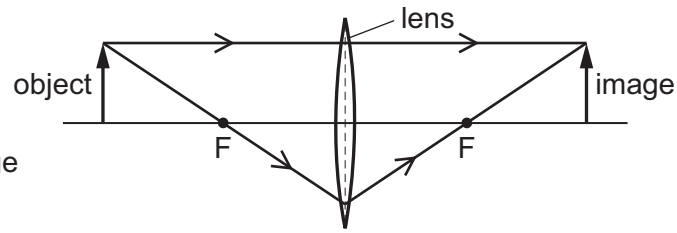
B



C



D



37 The string of a musical instrument moves regularly up and down several times each minute.

This causes the air to vibrate at the same rate and the vibrations of the air cause a sound.

The number of times the string moves up and down each minute increases.

What happens to the sound produced?

A It has a higher frequency.

B It has a higher speed.

C It has a lower frequency.

D It has a lower speed.

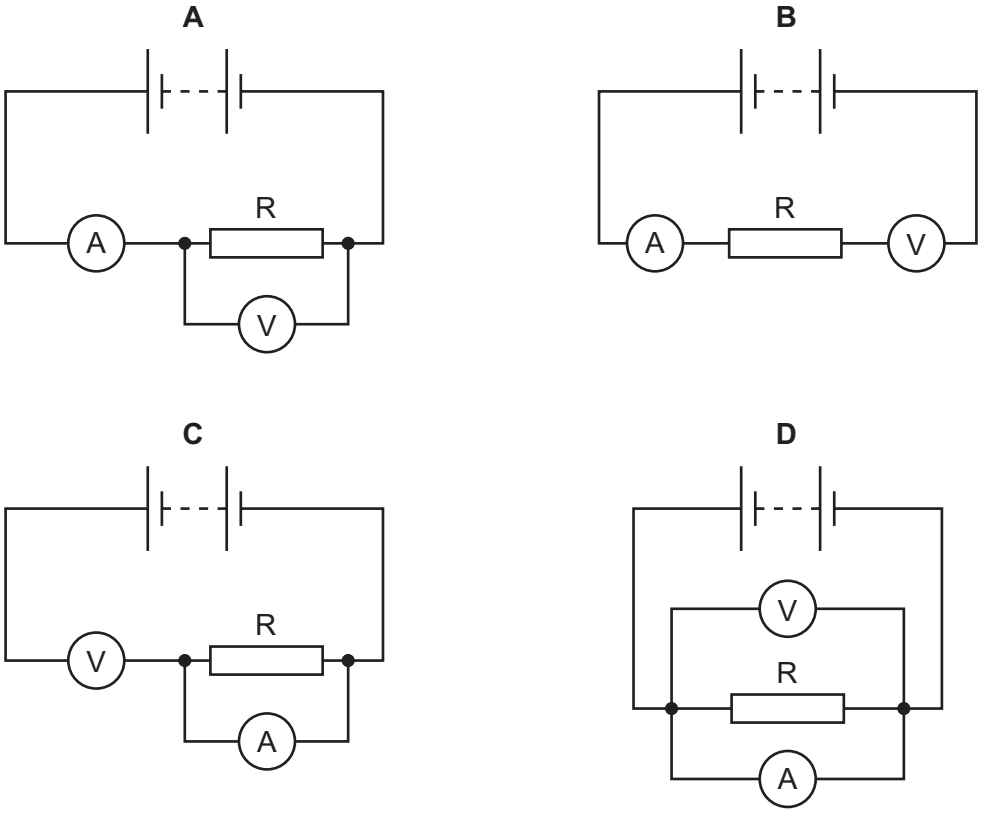
38 WX and YZ are rods that are uniformly electrically charged.

The rods are brought close together and end X repels end Y.

What happens when ends X and Z are brought close together and what happens when ends W and Y are brought close together?

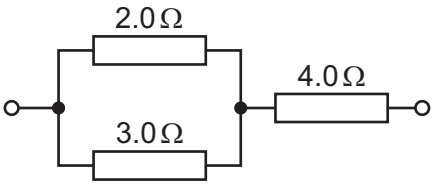
	X and Z	W and Y
A	attract	attract
B	attract	repel
C	repel	attract
D	repel	repel

39 Which circuit is used to determine the resistance of resistor R?

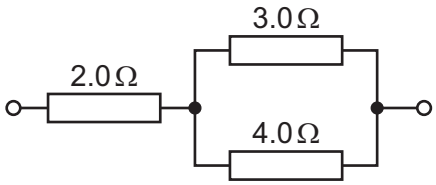


40 Which arrangement of resistors has the smallest combined resistance?

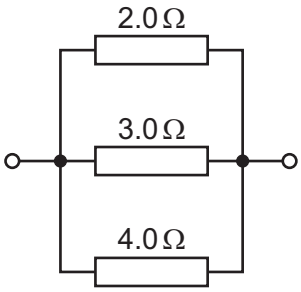
A



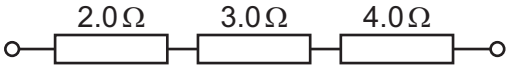
B



C



D



BLANK PAGE

The Periodic Table of Elements

Key

atomic number
atomic symbol
name
relative atomic mass

Group

I	II											III	IV	V	VI	VII	VIII
							1 H hydrogen 1										2 He helium 4
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 oganesson –

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
actinoids	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 dm^3 at room temperature and pressure (r.t.p.).