



Cambridge IGCSE™

COMBINED SCIENCE

0653/01

Paper 1 Multiple Choice (Core)

For examination from 2025

SPECIMEN PAPER

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.
- Take the weight of 1.0 kg to be 9.8 N (acceleration of free fall = 9.8 m/s^2).

INFORMATION

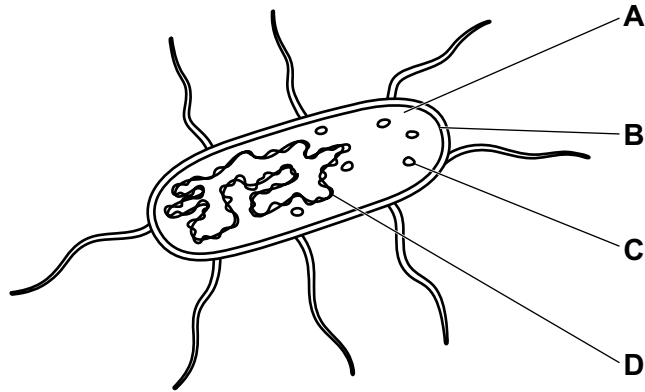
- The total mark for this paper is 40.
- Each correct answer will score one mark.
- Any rough working should be done on this question paper.
- The Periodic Table is printed in the question paper.

This document has **16** pages. Any blank pages are indicated.

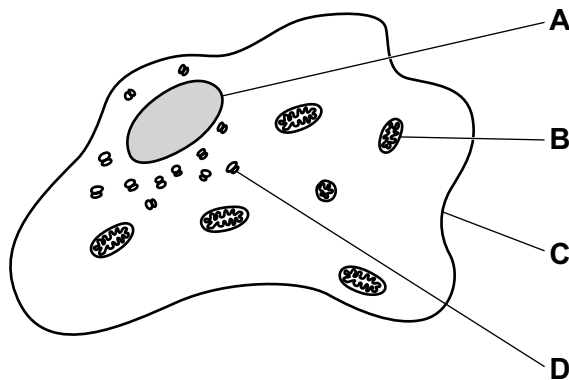
1 Which word describes an action by an organism that causes a change of position or place?

- A excretion
- B growth
- C movement
- D sensitivity

2 Which label represents a plasmid in this diagram of a bacterium?



3 Which label shows the site of aerobic respiration in this diagram of an animal cell?

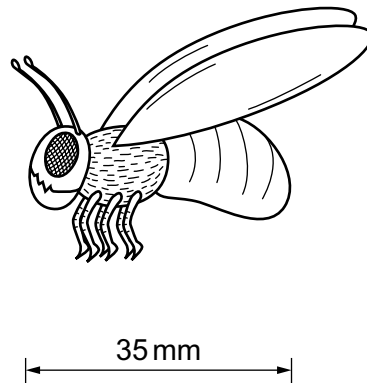


4 What is a type of tissue in a living organism?

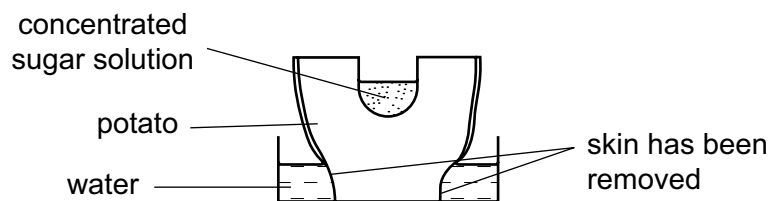
- A blood
- B heart
- C plasma
- D plasmid

- 5 The actual length of a phorid fly is 5.5 mm.

What is the magnification of this diagram of a phorid fly?

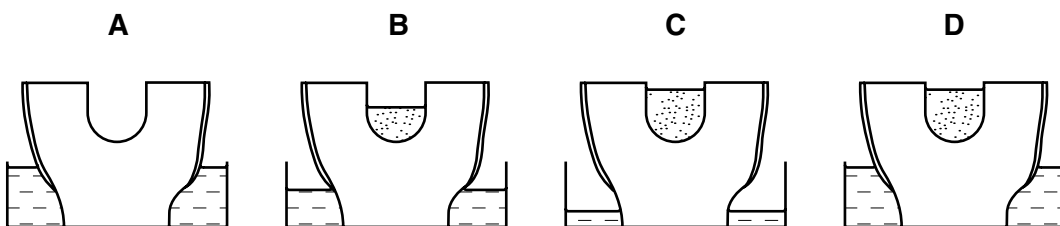


- A 0.16
 B 0.7
 C 6.4
 D 192.5
- 6 The diagram shows an uncooked potato being used in an experiment. The skin of the potato was removed as shown.



The experiment was left for a few hours.

Which diagram shows the result?



- 7 The data shows the concentrations of sugar and starch in an onion.

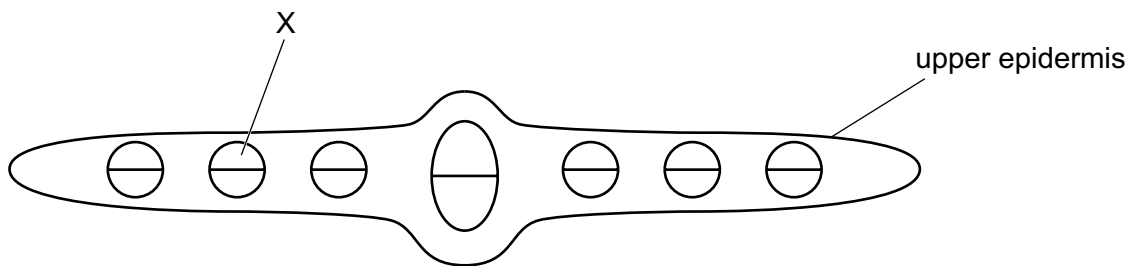
total sugar including reducing sugar /g per 100 g	starch /g per 100 g
3.7	0.0

The onion is tested with Benedict's solution and iodine solution.

Which set of results is correct?

	Benedict's solution	iodine solution
A	blue	blue-black
B	blue	yellow-brown
C	red	blue-black
D	red	yellow-brown

- 8 The diagram shows a cross-section through a leaf.



What are the functions of the tissue labelled X?

- 1 transport of amino acids
- 2 transport of sucrose
- 3 transport of water
- 4 support

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

- 9 What is **not** used to monitor the activity of the heart?

- A** an electrocardiogram (ECG)
B diet and exercise
C the pulse rate
D the sound of the heart valves

10 Which word best describes a disease-causing organism?

- A bacteria
- B pathogen
- C pollutant
- D virus

11 A doctor tells a patient that they are suffering from a viral infection.

Why would the doctor **not** prescribe antibiotics to the patient?

- A antibiotics do not affect viruses
- B antibiotics are drugs
- C long-term use of antibiotics may reduce the effectiveness against the viruses
- D some bacteria are resistant to antibiotics

12 Which row contains the words that can replace **X**, **Y** and **Z** in the description of a food chain?

Energy from the Sun is transferred as ...**X**... to be stored as ...**Y**... energy in a ...**Z**... .

	X	Y	Z
A	chemical	light	consumer
B	chemical	kinetic	producer
C	light	chemical	producer
D	light	kinetic	consumer

13 Biodiversity is the number of different ...**R**... in an area.

Which word replaces **R** in the sentence?

- A food chains
- B food-webs
- C organisms
- D species

- 14 Which row describes how the volume of a gas changes when the temperature is changed but the pressure stays the same?

	temperature	volume
A	decreases	decreases
B	stays the same	increases
C	increases	stays the same
D	increases	decreases

- 15 Which statement about ionic compounds is correct?

- A** They are good electrical conductors when dissolved in water.
B They are good electrical conductors when molten and when solid.
C They are formed when atoms share electrons.
D They have low melting points.

- 16 Which equation for the reaction between magnesium and dilute hydrochloric acid is correct?

- A** $\text{Mg(s)} + 2\text{HCl(l)} \rightarrow \text{MgCl}_2\text{(l)} + \text{H}_2\text{(g)}$
B $\text{Mg(s)} + 2\text{HCl(aq)} \rightarrow \text{MgCl}_2\text{(aq)} + \text{H}_2\text{(g)}$
C $2\text{Mg(s)} + 2\text{HCl(l)} \rightarrow 2\text{MgCl}_2\text{(l)} + \text{H}_2\text{(g)}$
D $2\text{Mg(s)} + 2\text{HCl(aq)} \rightarrow 2\text{MgCl}_2\text{(aq)} + \text{H}_2\text{(g)}$

- 17 Which equation shows a reduction of the underlined substance?

- A** $\underline{\text{C}} + \text{O}_2 \rightarrow \text{CO}_2$
B $\text{C} + \underline{\text{CO}_2} \rightarrow 2\text{CO}$
C $\underline{\text{Mg}} + \text{H}_2\text{O} \rightarrow \text{MgO} + \text{H}_2$
D $\text{NaOH} + \underline{\text{HCl}} \rightarrow \text{NaCl} + \text{H}_2\text{O}$

18 The products of a reaction are water, calcium chloride and carbon dioxide only.

Which reaction mixture gives these products?

- A calcium and hydrochloric acid
- B calcium hydroxide and hydrochloric acid
- C calcium carbonate and hydrochloric acid
- D calcium oxide and hydrochloric acid

19 Which row identifies the formulas of an acidic oxide and a basic oxide?

	acidic oxide	basic oxide
A	NO ₂	CaO
B	SO ₂	CO ₂
C	CuO	Na ₂ O
D	Li ₂ O	SiO ₂

20 Which statement describes the trends shown by the elements down Group I of the Periodic Table?

- A They become less dense and less reactive.
- B They become less dense and more reactive.
- C They become more dense and less reactive.
- D They become more dense and more reactive.

21 Which statements about the transition elements are correct?

- 1 They have low densities.
- 2 They form coloured compounds.
- 3 They often act as catalysts.
- 4 They have low melting points.

- A 1 and 2 only B 1 and 4 only C 2 and 3 only D 3 and 4 only

- 22 Which statement describes helium and neon?
- A They are diatomic and have high thermal conductivities.
 - B They are diatomic and have low melting points.
 - C They are monatomic and have high boiling points.
 - D They are monatomic and have low electrical conductivities.
- 23 Which statement about the industrial extraction of metals from their ores is correct?
- A Aluminium is obtained from bauxite.
 - B Iron is obtained by the electrolysis of iron(III) oxide.
 - C Iron is obtained by the oxidation of iron(III) oxide.
 - D The higher a metal is in the reactivity series the easier it is to extract.
- 24 What is used to remove tastes and odours from the domestic water supply during water treatment?
- A carbon
 - B chlorine
 - C filtration
 - D sedimentation
- 25 Which adverse effects are caused by particulates in the air?
- A acid rain and global warming
 - B cancer and respiratory problems
 - C global warming and cancer
 - D respiratory problems and acid rain
- 26 Petroleum is separated by fractional distillation.
- Which fraction is used as a fuel in diesel engines?
- A naphtha
 - B gasoline
 - C gas oil
 - D refinery gas

27 A mixture of salt solution and an insoluble solid is separated by ...**P**...

The insoluble solid that is collected is the ...**Q**...

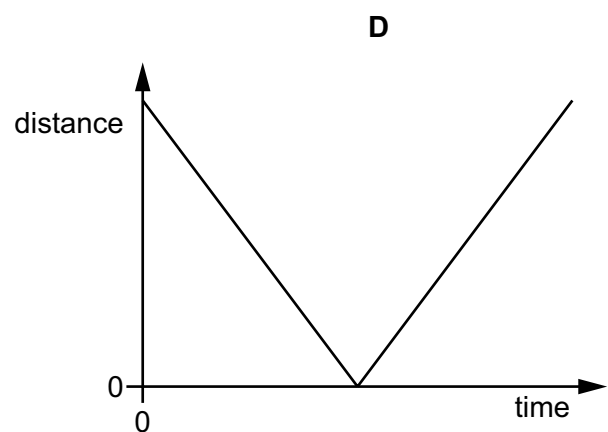
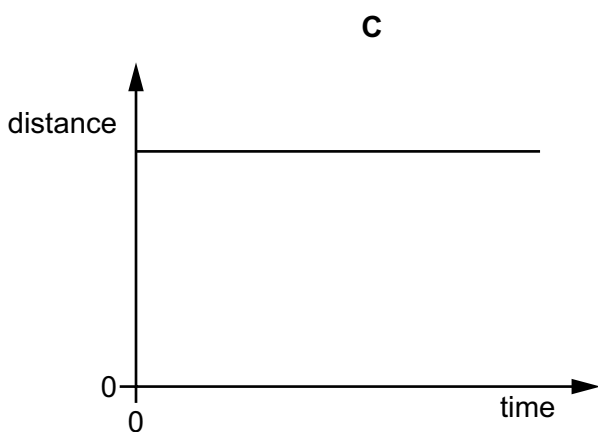
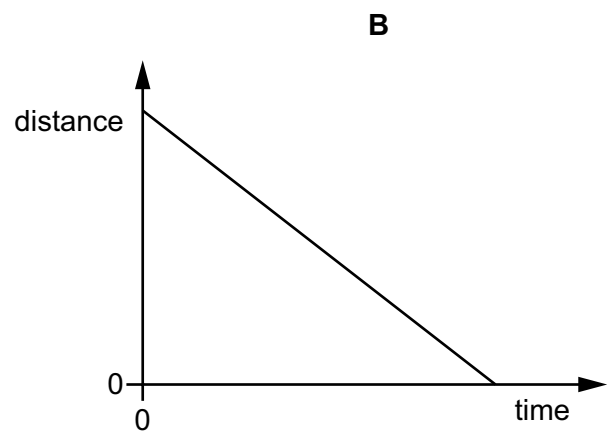
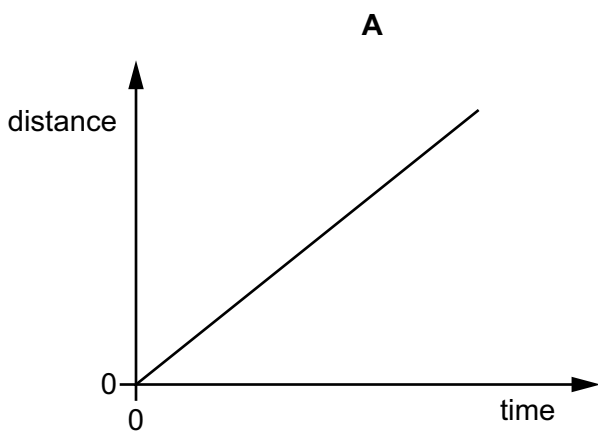
Pure salt crystals are obtained from the separated salt solution by ...**R**... of the water.

Which words complete gaps **P**, **Q** and **R**?

	P	Q	R
A	evaporation	filtrate	filtration
B	evaporation	residue	filtration
C	filtration	filtrate	evaporation
D	filtration	residue	evaporation

28 The diagrams show four distance–time graphs.

Which graph represents the motion of an object that is at rest?



29 A solid block has a density of 1.1 g/cm^3 .

The block is lowered into three liquids, **X**, **Y** and **Z**, with different densities.

The densities of the liquids are:

liquid **X**: 1.0 g/cm^3

liquid **Y**: 1.2 g/cm^3

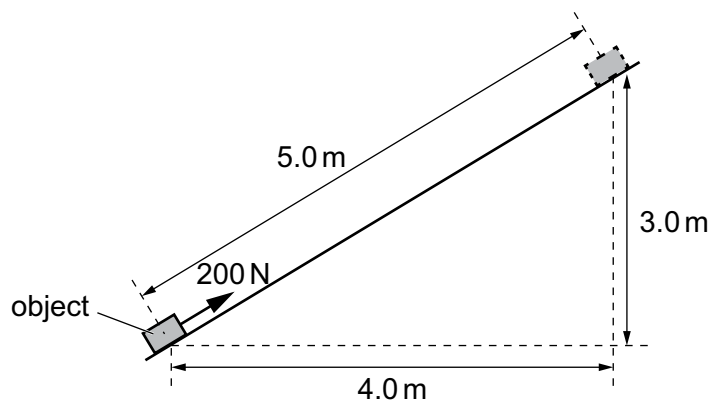
liquid **Z**: 1.3 g/cm^3 .

In which of the liquids does the block float?

- A in liquid **X** only
- B in liquids **Y** and **Z** only
- C in liquids **X**, **Y** and **Z**
- D in none of the liquids

30 The diagram shows a force of 200 N pulling an object up a slope. The object moves 5.0 m along the slope.

The object moves 3.0 m vertically upwards and 4.0 m horizontally, as shown in the diagram.



How much work is done by the 200 N force?

- A 600 J
- B 800 J
- C 1000 J
- D 1400 J

- 31 A sample of a substance has a definite shape and a definite volume.

The substance changes state. The sample now has **no** definite shape but still has a definite volume.

What is the name of the change of state?

- A condensation
- B evaporation
- C freezing
- D melting

- 32 Which statement about thermal radiation is correct?

- A It can travel through a vacuum.
- B It is absorbed more quickly by shiny surfaces than by dull surfaces.
- C It is emitted more quickly by shiny surfaces than by dull surfaces.
- D It is mainly ultraviolet radiation.

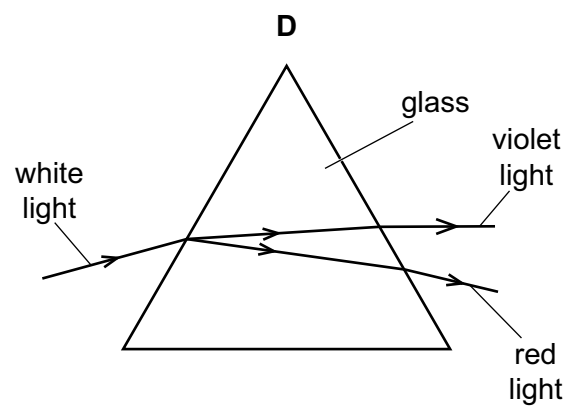
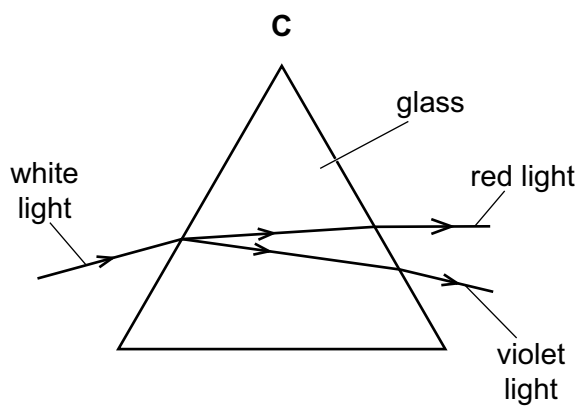
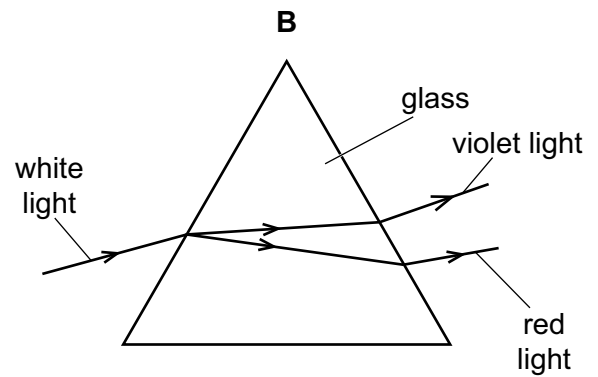
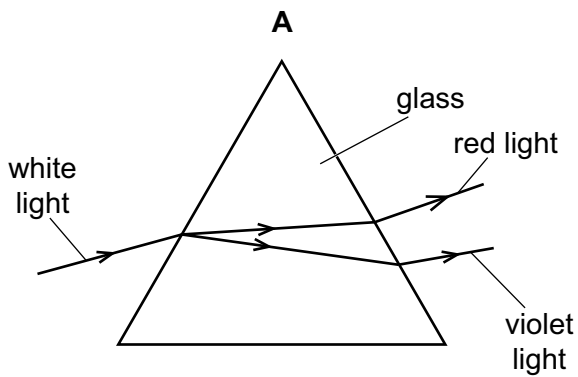
- 33 A wave has a frequency of 6.0 kHz and travels at a speed of 300 m/s.

What is the wavelength of the wave?

- A 0.020 m
- B 0.050 m
- C 20 m
- D 50 m

34 White light passes through a glass prism and produces a spectrum.

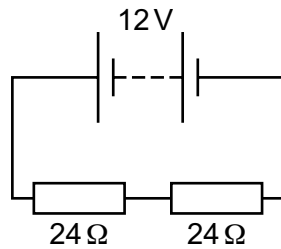
Which diagram shows the paths of the red light and the violet light?



35 What is the frequency range of ultrasound?

- A all frequencies between 20 Hz and 20 kHz
- B all frequencies higher than 20 kHz
- C all frequencies lower than 20 Hz
- D all frequencies lower than 20 Hz and all frequencies higher than 20 kHz

- 36 Two $24\ \Omega$ resistors are connected in series to a 12 V battery.



What is the current in **one** of the resistors?

- A 0.25A
 - B 0.50A
 - C 2.0A
 - D 4.0A
- 37 An electric heater and an electric motor are connected to a mains power supply.

The power of the heater is 3.0 kW and the power of the motor is 1.0 kW.

The cost of electricity is \$0.20 per kWh.

What is the total cost of using the heater and the motor for 5.0 hours?

- A \$0.12
 - B \$0.16
 - C \$3.00
 - D \$4.00
- 38 A teacher wants to connect an electric heater to the mains supply.
- The safety label on the heater states that the heater is double-insulated.
- What does the teacher know from reading this label?
- A The outer casing of the heater does **not** need to be earthed.
 - B The outer casing of the heater must be earthed.
 - C The heater needs two fuses.
 - D The heater needs two trip switches.

- 39** What is a light-year?
- A** the distance travelled by light in a vacuum in 1 year
 - B** the distance travelled by light in a vacuum in 100 000 years
 - C** the time taken for light to travel across the Universe
 - D** the time taken for light to travel across the Milky Way galaxy
- 40** Which sequence is part of the life cycle of a small star (about the same size as the Sun)?
- A** red giant → planetary nebula + white dwarf
 - B** red giant → supernova → black hole
 - C** red supergiant → planetary nebula + black hole
 - D** red supergiant → supernova → white dwarf

The Periodic Table of Elements

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

lanthanoids

actinoids

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.).

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