Cambridge
O Level

Cambridge Assessment International Education
Cambridge Ordinary Level

COMBINED SCIENCE **5129/12**

Paper 1 Multiple Choice **October/November 2019**

1 hour

Additional Materials: Multiple Choice Answer Sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

6426017358

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.
Do not use staples, paper clips, glue or correction fluid.
Write your name, centre number and candidate number on the Answer Sheet in the spaces provided unless this has been done for you.
DO **NOT** WRITE IN ANY BARCODES.

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 separate Answer Sheet.

Read the instructions on the Answer Sheet very carefully.

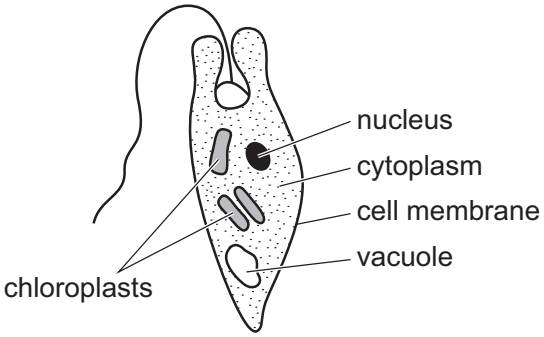
Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
Any rough working should be done in this booklet.
A copy of the Periodic Table is printed on page 16.
Electronic calculators may be used.

This document consists of **15** printed pages and **1** blank page.

Cambridge Assessment International Education

1 The diagrams show four different single celled organisms.

W



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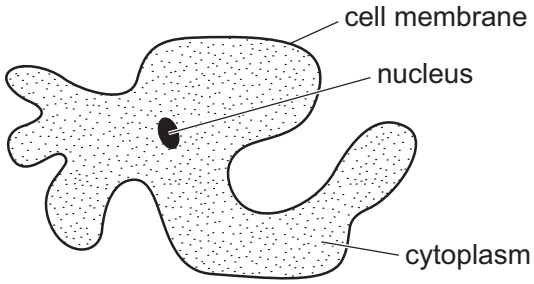

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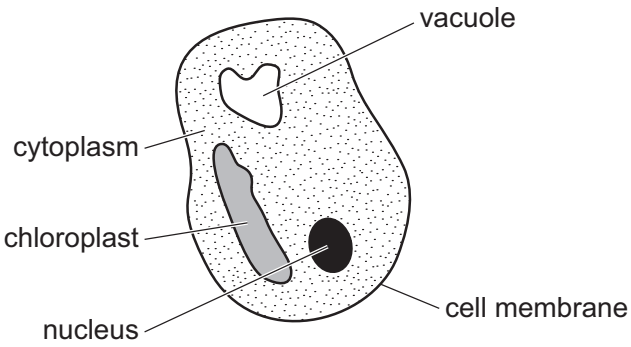
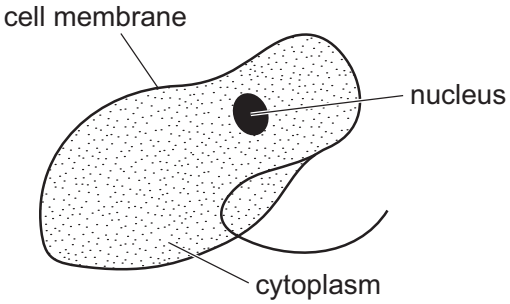


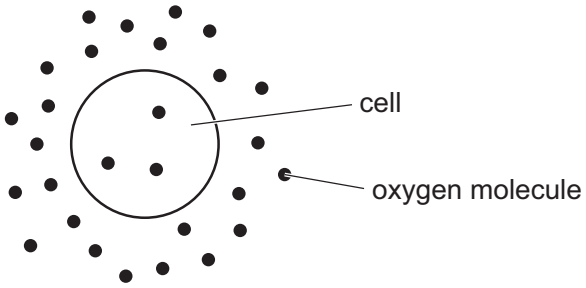
Z



Which two organisms can synthesise food?

A W and X **B** W and Y **C** X and Z **D** Y and Z

2 The diagram represents oxygen molecules around and inside a cell.



Which statement explains why oxygen molecules move into the cell?

A The oxygen molecules move from a high to a low concentration by diffusion.

B The oxygen molecules move from a high to a low concentration by osmosis.

C The oxygen molecules move from a low to a high concentration by diffusion.

D The oxygen molecules move from a low to a high concentration by osmosis.

3 What is the name of the group of proteins which act as catalysts in biological reactions?

A amino acids

B carbohydrates

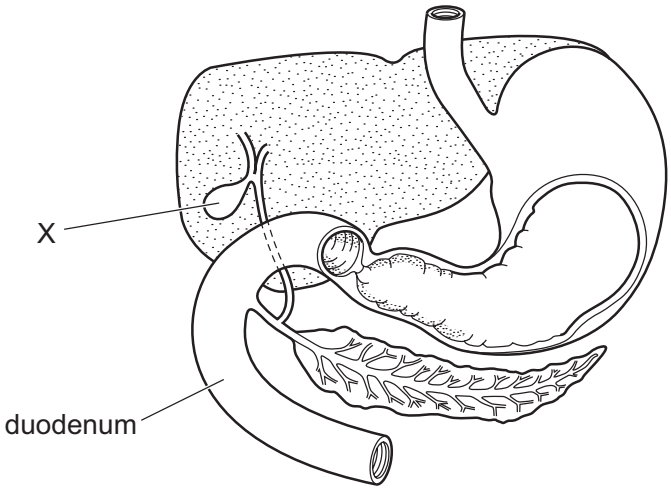
C enzymes

D hormones

4 Which row matches the feature of a leaf with its function?

	chloroplasts	spongy mesophyll	stomata
A	gas exchange	gas exchange	photosynthesis
B	gas exchange	transport	photosynthesis
C	photosynthesis	gas exchange	gas exchange
D	photosynthesis	transport	gas exchange

5 The diagram shows some organs in the human alimentary canal.



What is the function of X?

A to digest fats

B to make enzymes

C to store bile

D to store urine

6 Which statement correctly defines transpiration?

A loss of water vapour from the root hairs

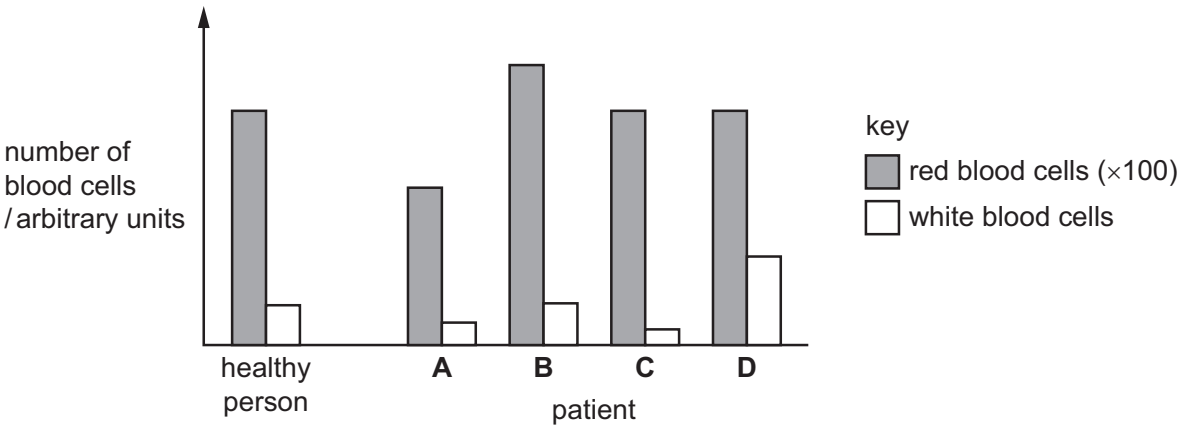
B loss of water vapour from the stomata

C movement of water in the phloem

D movement of water in the xylem

7 The graph shows the number of red and white blood cells in a healthy person and in four hospital patients.

Which patient has an infection?



8 What are the products of anaerobic respiration in muscle cells?

A carbon dioxide and a relatively large amount of energy

B carbon dioxide and a relatively small amount of energy

C lactic acid and a relatively large amount of energy

D lactic acid and a relatively small amount of energy

9 Which statements describe the removal of excretory products from the body?

1 Carbon dioxide is removed by the lungs.

2 Urea is removed by the liver.

3 Urea and water are removed by the kidneys.

4 Water is removed by the kidneys and lungs.

A 1, 2, 3 and 4

B 1, 2 and 3 only

C 1, 3 and 4 only

D 1 and 3 only

10 Which row describes what happens in the eye when it focuses on a near object?

	ciliary muscle	suspensory ligament
A	contracts	loosens
B	contracts	tightens
C	relaxes	loosens
D	relaxes	tightens

11 Which statement about heroin is correct?

A It does not cause withdrawal symptoms.

B It is a depressant.

C It is an enzyme.

D It is not associated with causing infections.

12 Which gas damages gaseous exchange surfaces?

A argon

B carbon dioxide

C nitrogen

D sulfur dioxide

13 Which combination of factors is least likely to stop menstruation?

	diet	stress
A	balanced	high
B	balanced	low
C	unbalanced	high
D	unbalanced	low

14 Which method is used to separate ethanol from an aqueous solution of ethanol?

A chromatography

B crystallisation

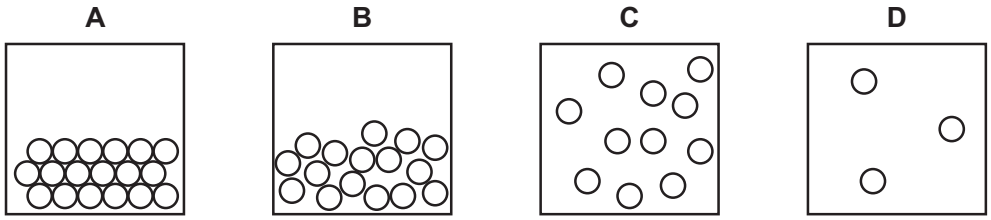
C filtration

D fractional distillation

[Turn over

15 The diagrams all show the same substance at a constant pressure but at different temperatures.

In which diagram do the particles have the lowest average kinetic energy?



16 Which row shows the number of protons and the number of neutrons in the two isotopes of chlorine, $^{35}_{17}Cl$ and $^{37}_{17}Cl$?

	^{35}Cl		^{37}Cl	
	protons	neutrons	protons	neutrons
A	35	17	37	17
B	18	35	20	37
C	17	35	17	37
D	17	18	17	20

17 Which row describes how ions are formed and the types of element that combine to form ionic bonds?

	how ions form	types of element that combine to form ionic bonds
A	atoms gain and lose electrons	metal and non-metal
B	atoms gain and lose electrons	non-metal and non-metal
C	atoms share electrons	metal and non-metal
D	atoms share electrons	non-metal and non-metal

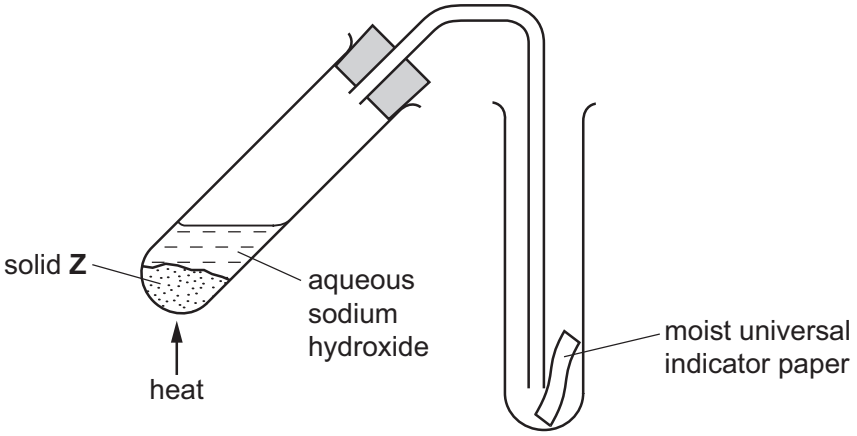
18 The equation shows the reaction between sodium and water.

$$x\text{Na} + y\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2$$

What are the values of *x* and *y* for the equation to be balanced?

	x	*y*
A	1	1
B	1	2
C	2	1
D	2	2

19 Apparatus is set up as shown.



When the test-tube is heated, the indicator paper turns blue.

What is solid **Z**?

A aluminium oxide

B ammonium sulfate

C calcium hydroxide

D copper(II) sulfate

20 Some properties of element X are listed.

- X forms an oxide, XO.
- XO reacts with hydrochloric acid to form a salt.
- XO does not react with alkali.

Which statement is correct?

A X is a metal and XO is amphoteric.

B X is a metal and XO is basic.

C X is a non-metal and XO is basic.

D X is a non-metal and XO is neither acidic nor basic.

21 Which statement about the elements in Group VII is correct?

A The atoms gain two electrons to form a noble gas electronic structure.

B They become more reactive down the group.

C They form diatomic molecules.

D They go from solid to gas down the group.

22 A grey solid with a melting point of 1500 °C is a good electrical conductor.

It is easily hammered into shape.

Which type of substance is the grey solid?

A covalent compound

B ionic compound

C metallic element

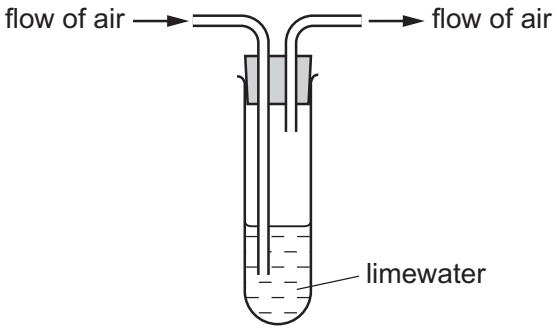
D non-metallic element

23 The uses of aluminium depend on its properties.

Which property does **not** explain why aluminium is used to make the stated object?

	property	object
A	good conductor of heat	saucepans
B	high density	aircraft parts
C	malleable	drinks can
D	resistant to corrosion	food containers

24 Air is drawn through the apparatus shown.



After 10 minutes the limewater becomes cloudy.

Which gas does this experiment show to be present in air?

A argon

B carbon dioxide

C nitrogen

D oxygen

25 What are the conditions used in the Haber Process to manufacture ammonia?

A 100 °C and 200 atmospheres

B 200 °C and 20 atmospheres

C 450 °C and 200 atmospheres

D 800 °C and 2000 atmospheres

26 The molecular formulas of four organic compounds, W, X, Y and Z, are shown.

W	X	Y	Z
C_4H_8	C_3H_8	C_3H_6	C_4H_{10}

Which statement is correct?

A W and Y have the same general formula.

B W and Z have the same general formula.

C X and Y belong to the same homologous series.

D Y and Z belong to the same homologous series.

[Turn over

27 Three chemical equations, each representing a reaction involving ethanol, are listed.

1 $C_2H_4 + H_2O \rightarrow C_2H_5OH$

2 $C_2H_5OH + 3O_2 \rightarrow 2CO_2 + 3H_2O$

3 $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$

Which statement is **not** correct?

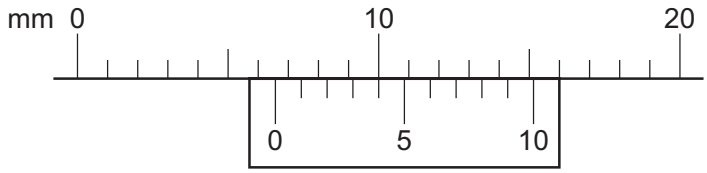
A Reactions 1 and 2 both represent the oxidation of ethanol.

B Reactions 1 and 3 both represent the production of ethanol.

C Reaction 2 is a combustion reaction.

D Reaction 3 represents fermentation.

28 The diagram shows a vernier scale.



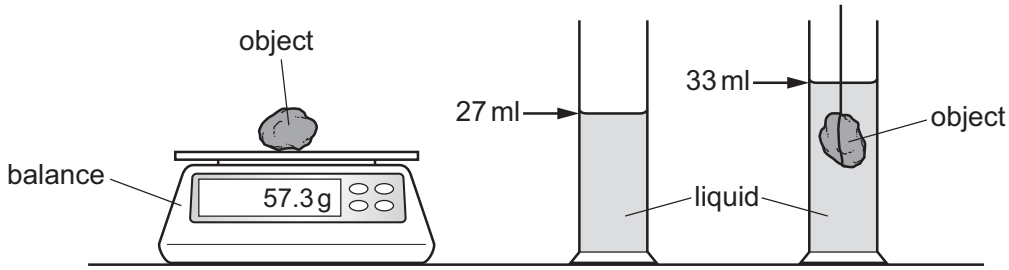
What is the reading shown?

A 5.4 mm **B** 6.4 mm **C** 10.0 mm **D** 16.0 mm

29 Which row for both mass and weight is correct?

	mass	weight
A	a force	measured in kg
B	a measure of the amount of substance in a body	depends on the gravitational field strength
C	depends on the gravitational field strength	a force
D	measured in kg	a measure of the amount of substance in a body

30 A student measures the mass of an object, the volume of a liquid in a cylinder and the volume of the liquid with the object submerged in it.



What is the density of the object?

A 0.10 g / cm^3 **B** 1.7 g / cm^3 **C** 2.1 g / cm^3 **D** 9.6 g / cm^3

31 Many methods of generating electricity rely, either directly or indirectly, on energy from the Sun.

Which method does **not** rely on energy from the Sun?

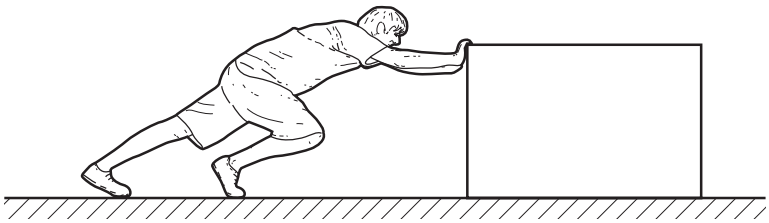
A geothermal power stations

B hydroelectric power stations

C photovoltaic solar panels

D wind turbines

32 A man pushes a heavy box across a floor. He exerts a force of 80 N and the box moves 4.0 m in 5.0 seconds.



What useful power does the man develop?

A 4.0 W **B** 64 W **C** 100 W **D** 1600 W

33 The volume of a fixed mass of liquid can be used to measure temperature.

Why is this?

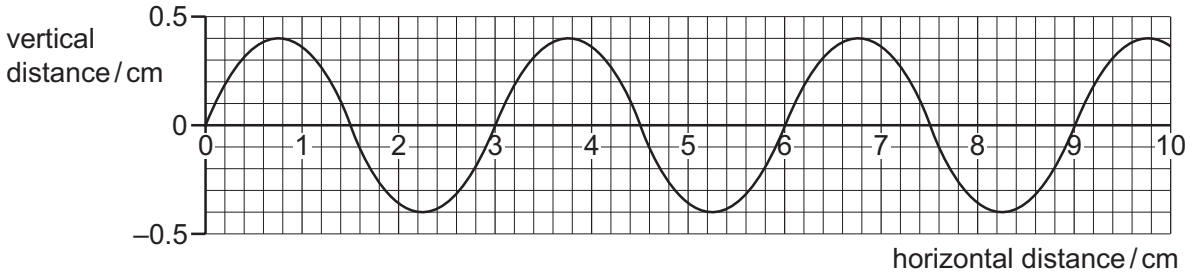
A The liquid can be coloured.

B The liquid expands when it is heated.

C The liquid is a poor conductor of heat.

D The liquid is cheap.

34 The diagram shows a graph of a wave.



Which row gives the wavelength and amplitude of this wave?

	wavelength / cm	amplitude / cm
A	1.5	0.4
B	1.5	0.8
C	3.0	0.4
D	3.0	0.8

35 Radio waves, visible light and X-rays are all components of the electromagnetic spectrum.

What is the correct order of increasing wavelength?

	shortest wavelength	→	longest wavelength
A	visible light	radio waves	X-rays
B	visible light	X-rays	radio waves
C	X-rays	radio waves	visible light
D	X-rays	visible light	radio waves

36 Objects P, Q, R and S are all charged.

R is negatively charged and attracts P but repels Q.

S is positively charged.

What happens between S, P and Q?

A P and S both attract Q.

B P and S both repel Q.

C P attracts Q but S repels Q.

D P repels Q but S attracts Q.

37 A 230 V supply provides a domestic light bulb with a current of 0.25 A.

A 12 V battery provides a car headlamp with a current of 4.0 A.

A 3.0 V battery provides a torch light bulb with a current of 0.20 A.

Which has the highest resistance and which the lowest resistance?

	highest resistance	lowest resistance
A	domestic light bulb	car headlamp
B	domestic light bulb	torch light bulb
C	torch light bulb	car headlamp
D	torch light bulb	domestic light bulb

38 Why is the core of an electromagnet made of soft iron?

A soft iron has a high density

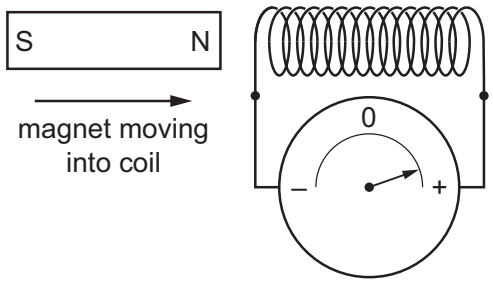
B soft iron is a good conductor of electricity

C soft iron loses its magnetism when the current is switched off

D soft iron is attracted to magnets

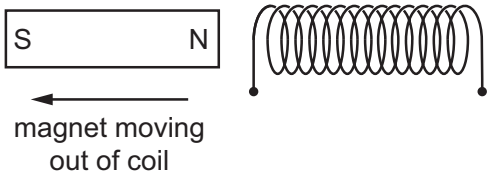
[Turn over

39 The diagram shows a magnet being pushed into a coil of wire. The deflection on the meter shows the direction of the induced electromotive force (e.m.f.).

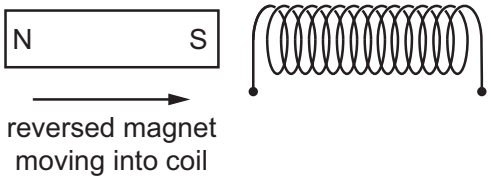


Which arrangement and movement of the magnet and coil gives a deflection in the same direction?

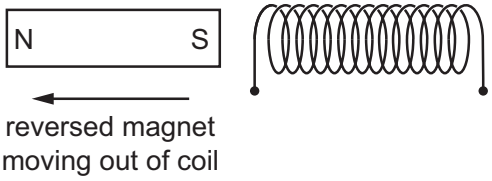
A



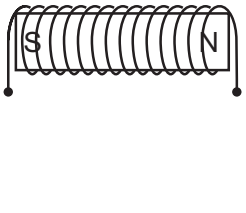
B



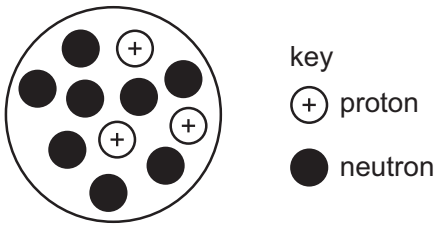
C



D



40 The diagram represents the nucleus of a radioactive isotope of element X.



The nucleus decays by emitting a beta-particle to become the nucleus of an isotope of element Y.

Which notation represents the nuclide of element Y?

A $^{10}_{3}Y$ **B** $^{7}_{4}Y$ **C** $^{10}_{4}Y$ **D** $^{11}_{4}Y$

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The Periodic Table of Elements

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 –		114 Fl flerovium –		116 Lv livermorium –		

Key

atomic number
atomic symbol
name
relative atomic mass

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.).