Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CO-ORDINATED SCIENCES **0654/11**

Paper 1 Multiple Choice (Core) **October/November 2019**

45 minutes

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

2635199530

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.

1 Which process do all living organisms carry out?

A asexual reproduction

B excretion

C ingestion

D photosynthesis

2 Which statement about animal cells and plant cells is correct?

A Only animal cells possess cell membranes.

B Only animal cells possess cell walls.

C Only plant cells possess cell membranes.

D Only plant cells possess cell walls.

3 Which result with the biuret test shows that protein is present?

A blue

B green

C orange

D purple

4 Which statements are correct for all enzymes?

1 They are proteins.

2 They are unaffected by temperature.

3 They speed up chemical reactions.

4 They work best at a high pH.

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

5 What is the word equation for photosynthesis?

A carbon dioxide + glucose → oxygen + water

B carbon dioxide + water → oxygen + glucose

C oxygen + glucose → carbon dioxide + water

D oxygen + water → carbon dioxide + glucose

6 Which process can be defined as the movement of small, water-soluble food molecules through the wall of the intestine into the blood?

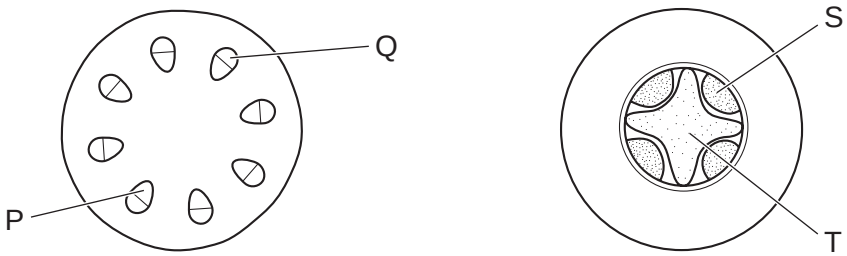
A absorption

B assimilation

C digestion

D egestion

7 The diagrams show sections through a stem and a root.

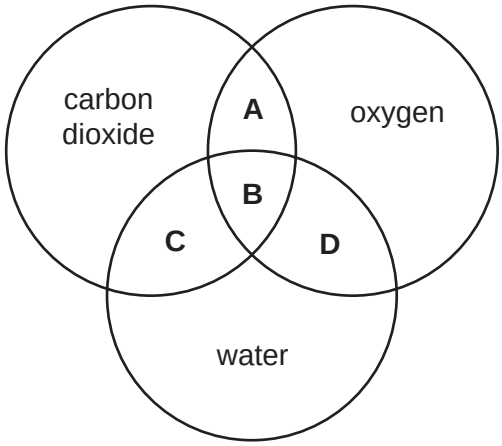


stem root

Which indicate the positions of the xylem?

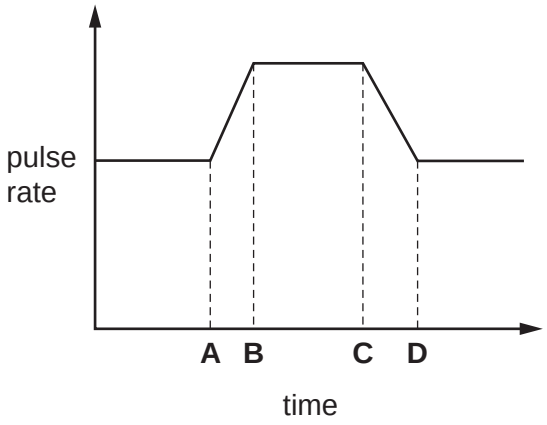
A P and S **B** P and T **C** Q and S **D** Q and T

8 Which area represents the substances produced in aerobic respiration?



9 The graph shows the pulse rate over a period of time.

At which point was adrenaline released into the blood?

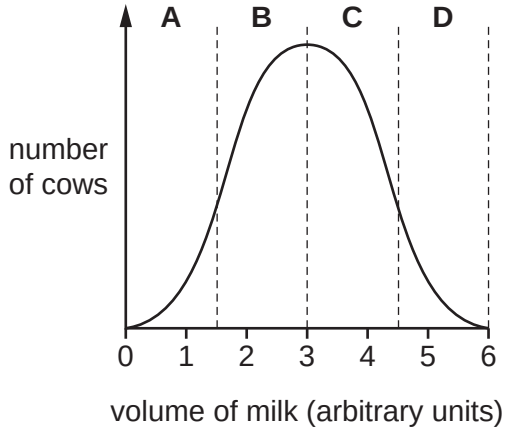


10 Which row is correct about human gametes?

	site of female gamete production	site of male gamete production
A	ovaries	sperm ducts
B	ovaries	testes
C	oviduct	sperm ducts
D	oviduct	testes

11 The graph shows the number of cows producing different volumes of milk.

Which group of cows should be used in a programme to breed more cows with the highest milk yield?



12 The diagram shows a food chain.

grass → grasshopper → frog → snake → buzzard

Which is correct?

A The buzzard is a producer.

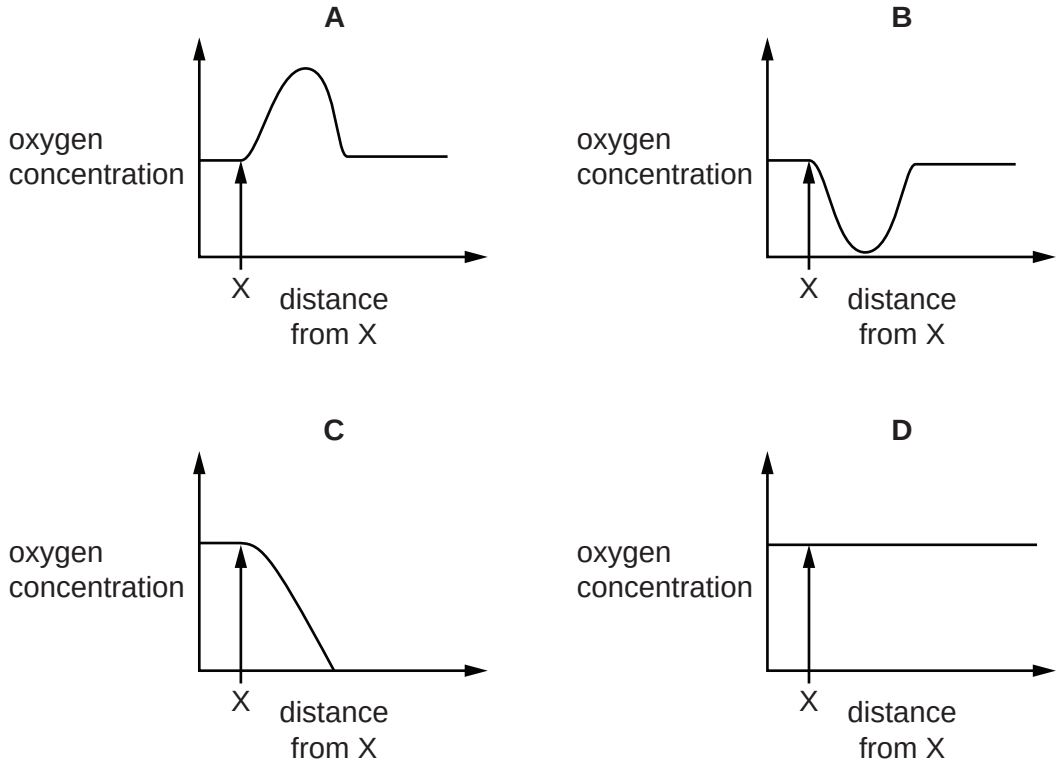
B The frog is a primary consumer.

C The grasshopper is a secondary consumer.

D The snake is a tertiary consumer.

13 Untreated sewage is released into a river at point X.

Which graph correctly shows changes in oxygen concentration of the water as the river flows away from X?



14 Which statement describes the arrangement of particles in a solid?

A The particles are close together and move randomly.

B The particles are close together and vibrate about a fixed point.

C The particles are far apart and move randomly.

D The particles are far apart and vibrate about a fixed point.

15 Which processes are chemical changes?

1 conversion of steam to liquid water

2 cracking of alkanes

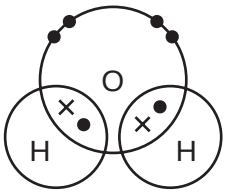
3 fractional distillation of petroleum

4 thermal decomposition of calcium carbonate

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

16 What is the dot-and-cross diagram for a water molecule?

A



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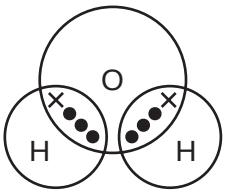

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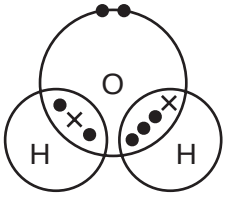

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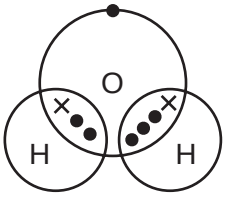


17 Hydrogen peroxide is a compound.

A molecule of hydrogen peroxide can be represented as shown.

key

= oxygen

= hydrogen

What is the formula of hydrogen peroxide?

A HO **B** H_2O_2 **C** $(OH)_2$ **D** 2OH

18 Concentrated aqueous sodium chloride is electrolysed using inert electrodes.

Which row identifies the product at each electrode?

	product at anode	product at cathode
A	chlorine	sodium
B	hydrogen	chlorine
C	sodium	chlorine
D	chlorine	hydrogen

19 The table shows the temperature of some water before and after a solid is dissolved in it.

Which change is the most exothermic?

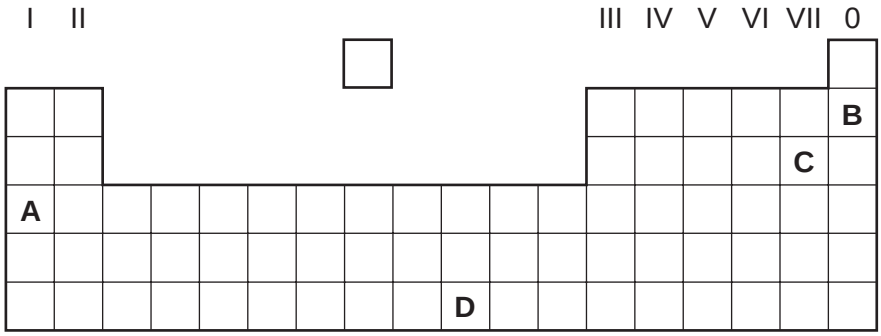
	temperature before / °C	temperature after / °C
A	20	18
B	20	40
C	25	18
D	25	42

20 Hydrogen peroxide decomposes very slowly.

When element X is added, hydrogen peroxide decomposes much faster.

Element X is unchanged at the end of this reaction.

What is element X?



21 The pH values of four liquids are 1, 4, 7 and 13.

The four liquids are distilled water, nitric acid, potassium hydroxide and vinegar.

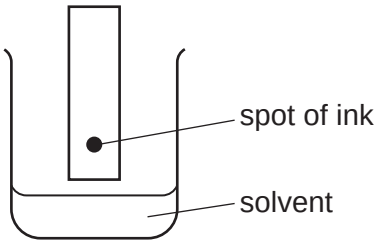
Which row shows the pH values of the liquids?

	distilled water	nitric acid	potassium hydroxide	vinegar
A	4	7	13	1
B	4	13	7	1
C	7	1	4	13
D	7	1	13	4

22 The colours in an ink can be separated by chromatography.

Which diagram shows the correct way to set up the apparatus?

A



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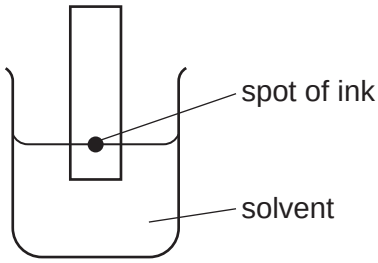

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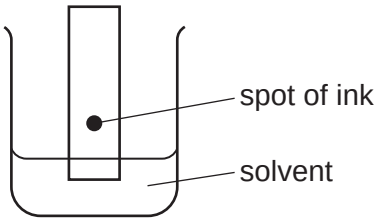

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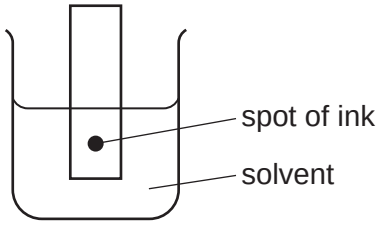


23 Which statement about the Periodic Table is correct?

A Elements are listed in order of neutron number.

B Elements are listed in order of nucleon number.

C Elements are listed in order of proton number.

D Elements are listed in order of relative atomic mass.

24 Four properties of metals are listed.

1 high melting point

2 low density

3 resistance to corrosion

4 conducts electricity

Which properties make aluminium suitable for use in cans containing drinks?

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

25 Which three elements are needed in fertilisers to help plants grow?

A nitrogen, phosphorus, potassium

B nitrogen, phosphorus, sodium

C nitrogen, sodium, potassium

D sodium, phosphorus, potassium

26 Which statement about the manufacture of lime from limestone is **not** correct?

A A high pressure is used.

B A high temperature is used.

C Carbon dioxide is produced.

D Thermal decomposition occurs.

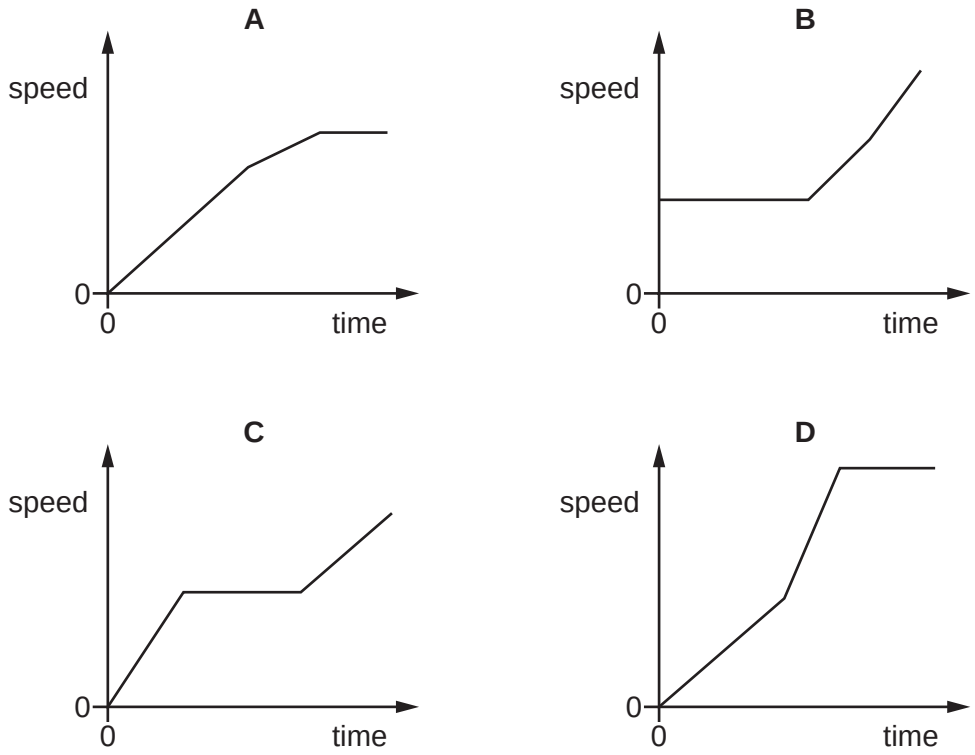
27 Petroleum is separated into useful fractions by fractional distillation.

Which row matches the fractions to their uses?

	fuel	heating and cooking	making chemicals
A	bitumen	naphtha	refinery gas
B	gasoline	bitumen	naphtha
C	gasoline	refinery gas	naphtha
D	naphtha	refinery gas	gasoline

28 The speed-time graphs represent the motion of a car moving in a straight line.

Which graph represents the car moving first with a constant acceleration, then with a larger constant acceleration and then with a constant speed?



29 An object has a mass of 20 kg and a density of 8400 kg / m^3.

What is the volume of the object?

A $2.4 \times 10^{-3}\,m^3$

B $4.2 \times 10^{2}\,m^3$

C $1.6 \times 10^{5}\,m^3$

D $1.7 \times 10^{5}\,m^3$

30 An engine is doing work on a car as the car moves along a road.

Which two changes **must** result in less work being done on the car by the engine?

A decreasing the engine's force on the car and decreasing the distance moved by the car

B decreasing the engine's force on the car and increasing the distance moved by the car

C increasing the engine's force on the car and decreasing the distance moved by the car

D increasing the engine's force on the car and increasing the distance moved by the car

31 The table shows four sources of energy used to generate electricity.

Which source is shown with a statement of whether it is renewable and whether it is reliable at all times?

	source	renewable	reliable at all times
A	coal	yes	no
B	nuclear fission	no	yes
C	tides	no	no
D	wind	yes	yes

32 The more energetic molecules of a liquid are escaping from its surface, causing the liquid to cool.

What is happening to the liquid?

A It is boiling.

B It is condensing.

C It is evaporating.

D It is melting.

33 A substance is a gas when its temperature is 65 °C.

How do the boiling point and the melting point of this substance compare with 65 °C?

	boiling point	melting point
A	above 65 °C	above 65 °C
B	above 65 °C	below 65 °C
C	below 65 °C	above 65 °C
D	below 65 °C	below 65 °C

34 Which material is a good thermal conductor?

A aluminium

B cardboard

C rubber

D wool

35 There is a battery of e.m.f. V in a circuit of total resistance R.

Which pair of changes **must** result in a larger current in the circuit?

A decreasing V and decreasing R

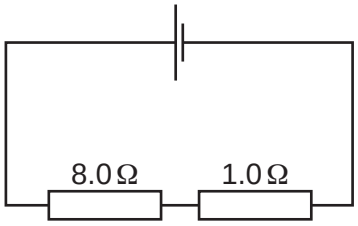
B decreasing V and increasing R

C increasing V and decreasing R

D increasing V and increasing R

36 Which circuit has the smallest resistance?

A



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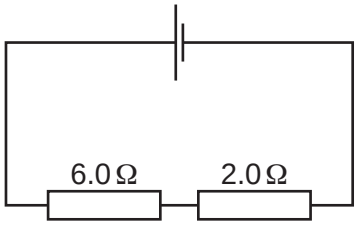

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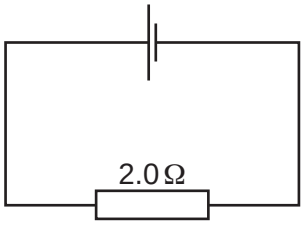

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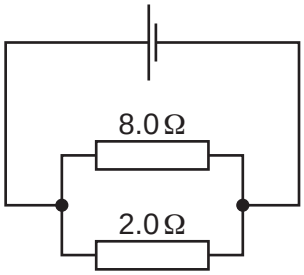
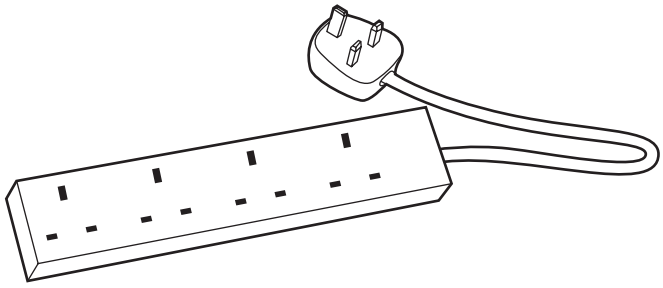


37 Which row shows how lamps are connected in a lighting circuit in a house and gives an advantage of connecting them in this way?

	how lamps are connected	advantage of connecting them in this way
A	in parallel	they can be switched separately
B	in parallel	they share the voltage
C	in series	they can be switched separately
D	in series	they share the voltage

38 An electrical extension block has four sockets, a cable which can safely take a current of 6 A and a plug. It is protected by a fuse rated at 5 A.



The extension block is used with four appliances and the 5 A fuse blows. The owner replaces the 5 A fuse with a 13 A fuse.

Why is the extension block now dangerous?

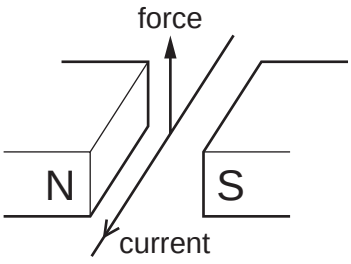
A The appliances may overheat before the fuse blows.

B The cable may overheat before the fuse blows.

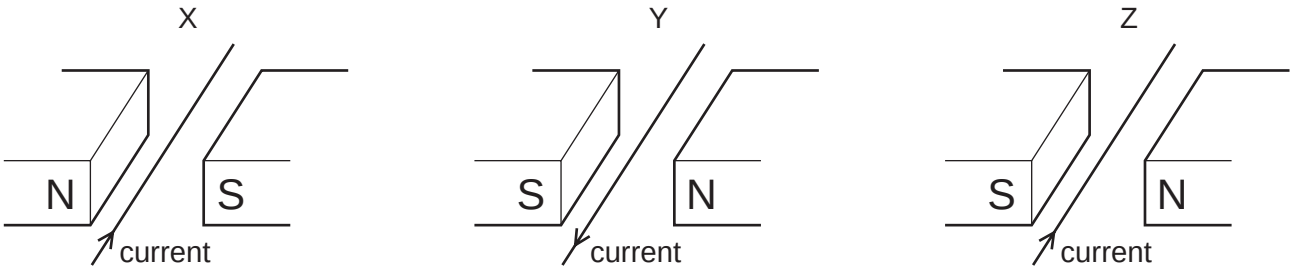
C The sockets may burn out before the fuse blows.

D The 13 A fuse may blow too soon.

39 A wire is placed between two magnetic poles. There is a current in the wire in the direction shown. The wire experiences an upward force.



There is also a force on the wire in arrangements X, Y and Z.



In which of the arrangements is the force upwards?

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

40 Which type of radiation has the greatest ionising effect, and which is the most penetrating?

	greatest ionising effect	most penetrating
A	α-particles	α-particles
B	α-particles	γ-rays
C	γ-rays	α-particles
D	γ-rays	γ-rays

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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.).