Cambridge Assessment International Education

Cambridge IGCSE™

COMBINED SCIENCE **0653/11**

Paper 1 Multiple Choice (Core) **May/June 2020**

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. A mark will not be deducted for a wrong answer.
- Any rough working should be done on this question paper.
- The Periodic Table is printed in the question paper.

This document has **16** pages. Blank pages are indicated.

IB20 06_0653_11/2RP
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1 What are three characteristics of living organisms?

	characteristic 1	characteristic 2	characteristic 3
A	breathing	reproduction	sensitivity
B	digestion	growth	movement
C	excretion	nutrition	transpiration
D	nutrition	reproduction	sensitivity

2 Which substance is required for photosynthesis to occur?

A chlorophyll

B glucose

C haemoglobin

D oxygen

3 The cytoplasm of a plant cell contains a 15% sugar solution. The plant cell is placed in sugar solutions of different concentrations.

In which solution would there be a net diffusion of water out of the cell?

A 5% sugar solution

B 10% sugar solution

C 15% sugar solution

D 20% sugar solution

4 Which row shows what starch molecules and protein molecules are made from?

	starch	proteins
A	glucose	amino acids
B	glucose	fatty acids
C	glycerol	amino acids
D	glycerol	fatty acids

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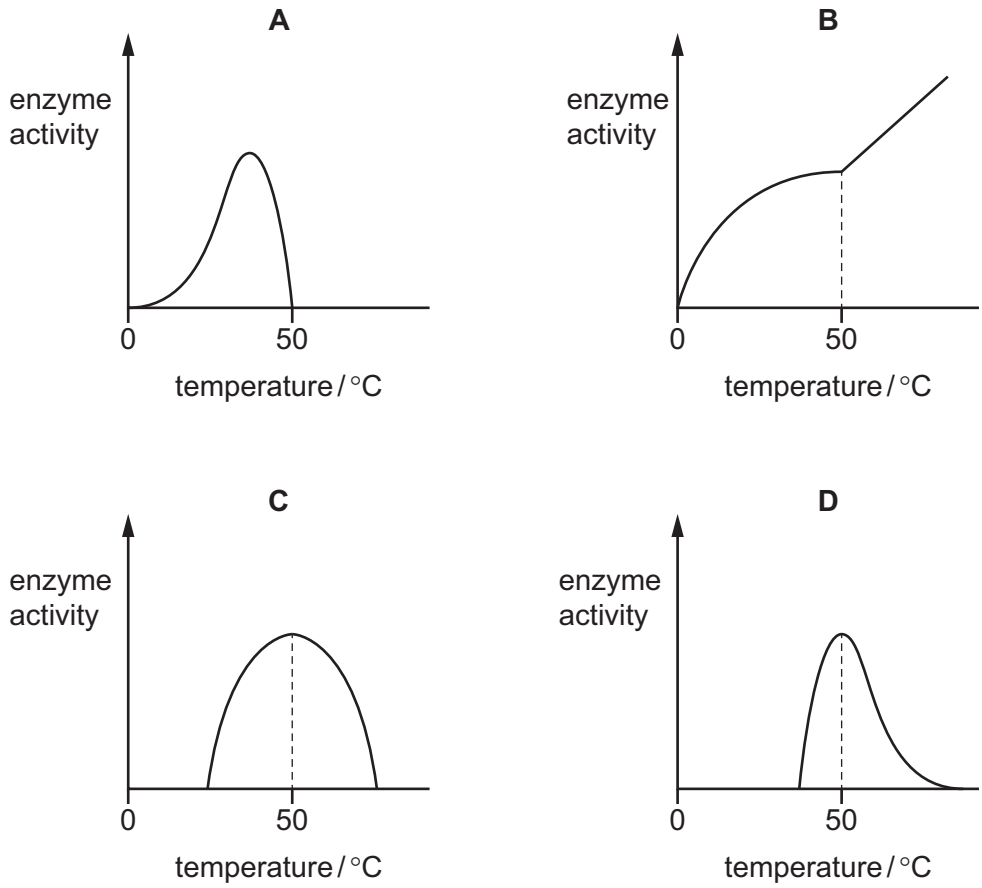
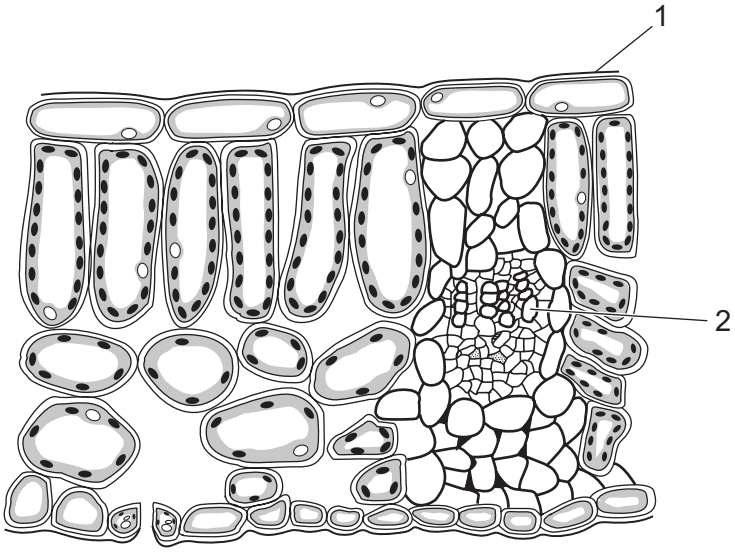
5 An enzyme can stop working at certain temperatures.

Which enzyme stops working when the temperature reaches 50 °C?



6 The diagram shows a section through part of a leaf as seen under a light microscope.



What are the labelled parts?

	1	2
A	cuticle	phloem
B	cuticle	xylem
C	epidermis	phloem
D	epidermis	xylem

7 Which features are found in a typical animal cell?

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

8 In the equation for aerobic respiration, what is X?

glucose + oxygen → X + water

A amino acids

B carbon dioxide

C oxygen

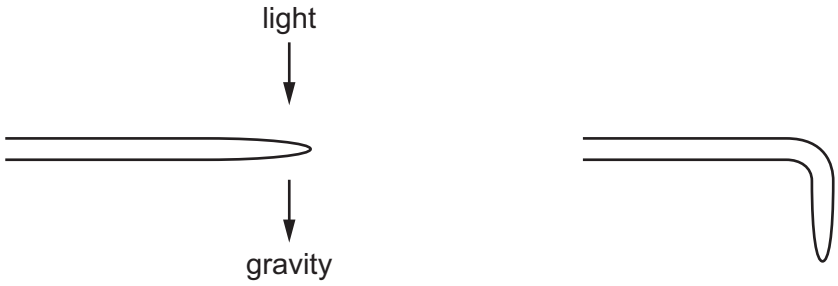
D starch

9 Four people have the same resting pulse rate and the same blood glucose concentration. The table shows their pulse rates and blood glucose concentrations later on the same day.

Which person has the highest concentration of adrenaline in their blood?

	pulse rate / beats per minute	blood glucose concentration /mg per dm^3
A	70	65
B	70	100
C	120	65
D	120	100

10 The diagram shows the root of a plant exposed to light and gravity, and the same root a day later.



Light does **not** influence the growth of roots in this plant.

Which row shows how the root has responded?

	gravitropism	phototropism
A	grows away from the stimulus	no response
B	grows towards the stimulus	no response
C	no response	grows away from the stimulus
D	no response	grows towards the stimulus

11 Which is a definition of asexual reproduction?

A production of genetically different offspring from one parent

B production of genetically different offspring from two parents

C production of genetically identical offspring from one parent

D production of genetically identical offspring from two parents

12 Which part of the male reproductive system in humans produces sperm?

A penis

B scrotum

C testes

D urethra

13 What is an undesirable effect of deforestation?

A a decrease in flooding

B an increase in atmospheric carbon dioxide

C an increase in the number of habitats for organisms

D an increase in the number of species

14 Which row identifies a substance that exists only as separate atoms and a substance that exists as a molecule?

	separate atoms	molecule
A	helium	methane
B	hydrogen	helium
C	neon	argon
D	oxygen	carbon dioxide

15 Which processes are involved in the separation of petroleum into useful fractions?

A condensation and crystallisation

B condensation only

C evaporation and condensation

D evaporation only

16 Salt, sand and water are stirred together in a beaker.

The salt dissolves in the water.

What does the beaker contain?

A a mixture of a solution and a solid

B a mixture of three elements

C only one compound and one solid

D only one compound containing three elements

17 Which ion is formed from a metal?

A Cl^- **B** H^+ **C** Na^+ **D** NH_4^+

18 Calcium hydroxide contains one calcium atom, two oxygen atoms and two hydrogen atoms.

What is the correct formula of calcium hydroxide?

A CaOH **B** $Ca(OH)_2$ **C** $CaOH_2$ **D** CaO_2H_2

19 Dilute sulfuric acid is electrolysed using inert electrodes.

What is formed at the anode?

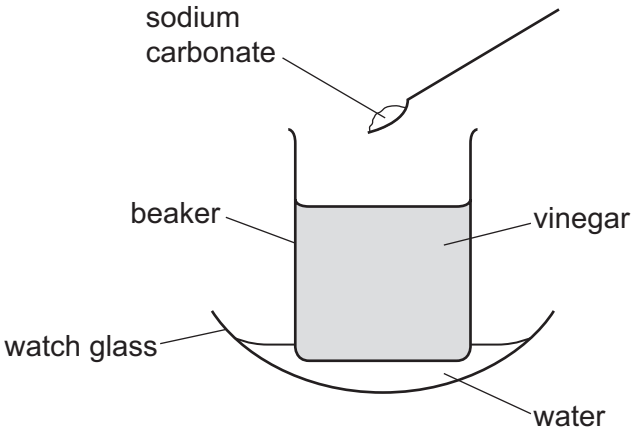
A hydrogen

B hydrogen sulfide

C oxygen

D sulfur dioxide

20 Solid sodium carbonate is added to vinegar in a beaker and stirred.



The water in the watch glass freezes.

Which statement about the reaction explains why the water freezes?

A It is a redox reaction.

B It is an endothermic reaction.

C It is catalysed by sodium carbonate.

D It is thermal decomposition.

21 A solid reacts with a solution.

Which change decreases the rate of the reaction?

A adding a catalyst

B using a higher concentration of the solution

C using a lower temperature

D using smaller pieces of the solid

22 Calcium oxide is added to water containing universal indicator. The universal indicator turns blue.

What is the pH of the solution?

A 1 **B** 6 **C** 7 **D** 11

23 Solution X is mixed with nitric acid and aqueous barium nitrate.

A white precipitate is formed.

Which ion is present in solution X?

A carbonate

B chloride

C nitrate

D sulfate

24 Element R reacts with chlorine to form a coloured ionic compound with the formula RCl_3.

RCl_3 acts as a catalyst in some reactions.

Which statement about element R is correct?

A It conducts electricity only when molten.

B It is a transition element.

C It has a low melting point.

D It has a low density.

25 Copper can be made from copper oxide by reacting it with carbon at a high temperature.

Why is carbon used?

A It does not react with copper.

B It is a conductor of electricity.

C It is a high melting point solid.

D It is more reactive than copper.

26 Which volume of air contains about 20 cm^3 of oxygen?

A 25 cm^3 **B** 50 cm^3 **C** 80 cm^3 **D** 100 cm^3

27 Which reaction involves combustion?

A calcium carbonate → calcium oxide + carbon dioxide

B methane + oxygen → carbon dioxide + water

C sodium carbonate + hydrochloric acid → sodium chloride + water + carbon dioxide

D sodium hydroxide + hydrochloric acid → sodium chloride + water

28 A car travels at various speeds during a short journey.

The table shows the distances travelled and the times taken during each of four stages P, Q, R and S.

stage	P	Q	R	S
distance travelled / km	1.8	3.6	2.7	2.7
time taken / minutes	2.0	2.0	4.0	3.0

During which two stages is the car travelling at the same average speed?

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

29 A solid, rectangular block of wood has length 4.0 cm, width 5.0 cm and height 6.0 cm.

The mass of the block is 90 g.

What is the density of the wood?

A 0.75 g / cm^3 **B** 1.3 g / cm^3 **C** 4.5 g / cm^3 **D** 6.0 g / cm^3

30 An object is travelling in a straight line at constant speed.

Which statement describes the resultant force on the object?

A It acts in the opposite direction to the motion of the object.

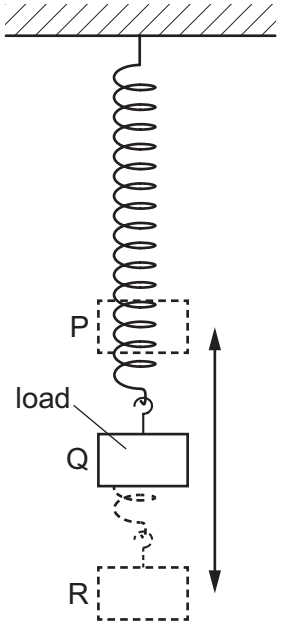
B It acts in the same direction as the motion of the object.

C It is constant, but not zero.

D It is zero.

31 A load hangs on a spring at point Q.

The load is now pulled down to point R and released. It moves up and down between its highest point P and its lowest point R.



Which statement describes the kinetic energy of the load?

A It is equal at points P, Q and R.

B It is greatest at point P.

C It is greatest at point Q.

D It is greatest at point R.

32 Electricity is generated using wind.

Which device is used in the process?

A dam

B nuclear reactor

C solar panel

D turbine

33 The molecules in a substance are close together but free to change positions with each other.

Which substance at 20 °C matches this description?

A air

B copper

C iron

D water

34 In diagram 1, a candle heats air and the heated air causes a decoration to spin.

Diagram 2 shows the Earth being warmed due to heat produced by the Sun.

diagram 1

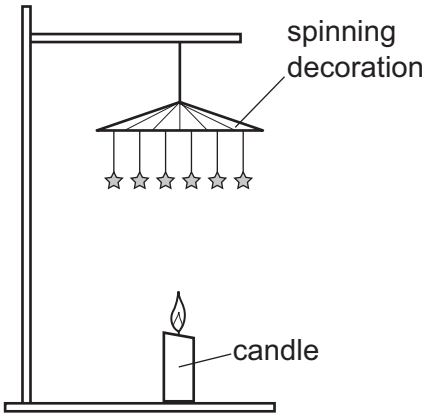
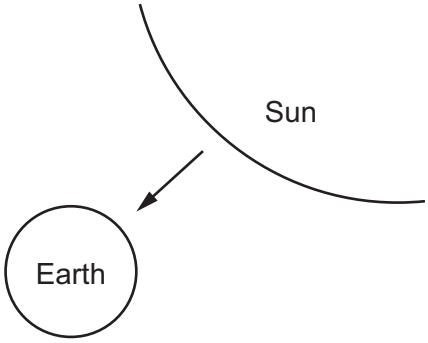


diagram 2

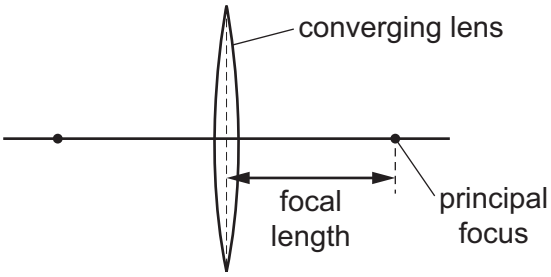


What is the main method of heat transfer involved in each case?

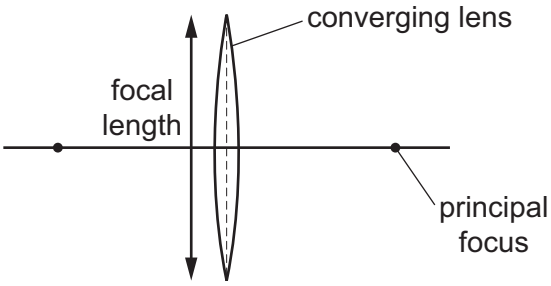
	candle to decoration	Sun to Earth
A	convection	convection
B	convection	radiation
C	radiation	convection
D	radiation	radiation

35 Which diagram of a converging lens is correctly labelled?

A



B



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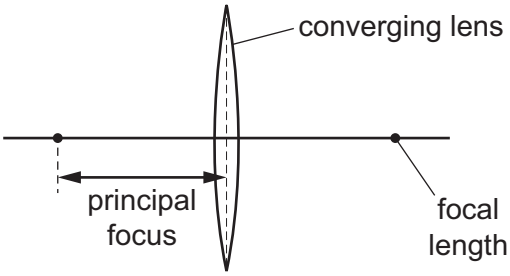
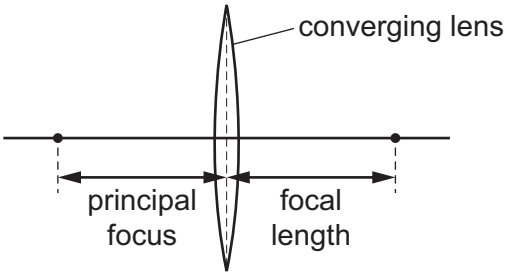


D



36 The sound from a drum is loud and has a low pitch.

Which row describes the amplitude and the frequency of the sound wave?

	amplitude	frequency
A	large	high
B	large	low
C	small	high
D	small	low

37 Which list contains only electrical insulators?

A air, rubber, copper

B iron, plastic, glass

C plastic, glass, air

D steel, gold, aluminium

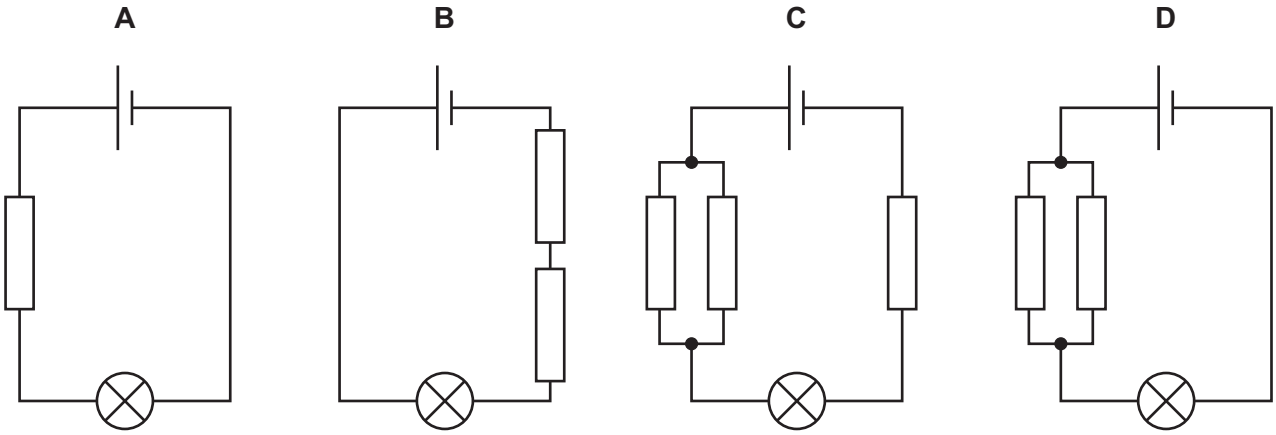
38 A potential difference (p.d.) of 10 V produces a current of 2.0 A in a resistor.

What is the resistance of the resistor?

A 0.050 Ω **B** 0.20 Ω **C** 5.0 Ω **D** 20 Ω

39 Four circuits contain identical cells, identical lamps and identical resistors.

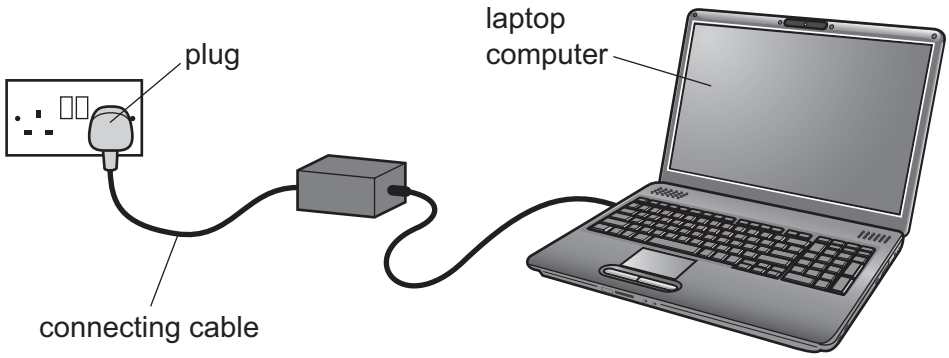
Which lamp glows most brightly?



40 The charger for a laptop computer is connected by a cable to the mains supply through a plug.

The plug contains a 13 A fuse. The cable is designed to carry a current of 2 A.

A fault develops and the current in the cable increases to 5 A.



What is a possible danger caused by this larger current?

A A large amount of electrical energy is wasted.

B Somebody receives an electric shock.

C The fuse blows and starts a fire.

D The cable overheats and starts a fire.

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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 –		114 Fl flerovium –		116 Lv livermorium –		

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.).

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