Cambridge Assessment International Education

Cambridge Lower Secondary Checkpoint

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

4758769240

SCIENCE **0893/01**

Paper 1 **April 2023**

45 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You should show all your working in the booklet.
- You may use a calculator.

INFORMATION

- The total mark for this paper is 50.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **20** pages. Any blank pages are indicated.

1 This question is about the human excretory (renal) system.

(a) Complete these sentences about the structure and function of the excretory (renal) system.

The excretory (renal) system filters blood.

Blood enters the ..... where it is filtered, and urine is formed.

This urine passes along a tube called the ..... towards the bladder.

The urine is stored in the bladder.

Urine is released from the body through a different tube called the ..... .

[3]

(b) The table shows the percentage concentration of four substances in blood plasma and in urine.

substance	percentage concentration of substance	
	in blood plasma	in urine
ammonia	0.00	0.05
protein	9.00	0.00
salt	0.60	0.90
urea	0.03	2.00

Which substance has the **greatest increase** in the urine compared to blood plasma?

Choose from the list.

ammonia **protein** **salt** **urea**

..... [1]

2 Aiko calculates the density of some objects.

(a) A block of iron has a mass of 19.68 g.

The volume of the block is 2.50 cm^3.

(i) Write down the equation Aiko uses to calculate density.

density = ... [1]

(ii) Calculate the density of Aiko's block of iron.

density = ... g/cm^3 [1]

(b) Aiko calculates the density of four objects.

Look at her results.

object	density in g/cm^3
A	2.7
B	8.4
C	0.002
D	13.6

Which object is a gas?

Circle the correct answer.

A **B** **C** **D**

Explain your answer.

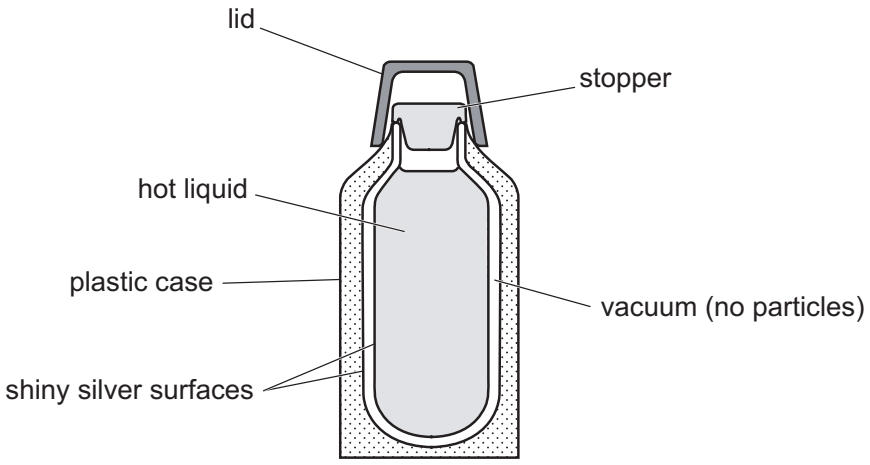
.....

[1]

3 Look at the diagram of a vacuum flask.

Gabriella puts a hot liquid into the vacuum flask.

The flask keeps the hot liquid warm.



(a) Which material is most suitable to make the stopper?

Circle the correct answer.

copper **gold** **iron** **plastic**

[1]

(b) (i) Suggest how the shiny silver surfaces help to keep the liquid warm.

..... [1]

(ii) The vacuum does **not** contain any particles.

Explain why the vacuum reduces the transfer of thermal energy.

.....

.....

..... [2]

(c) Gabriella removes the lid and the stopper from the vacuum flask.

Some of the hot liquid evaporates.

What happens to the temperature of the liquid that remains in the vacuum flask?

Explain why.

Use ideas about particles.

.....

.....

..... [3]

4 The Earth's crust is made of a number of large pieces.

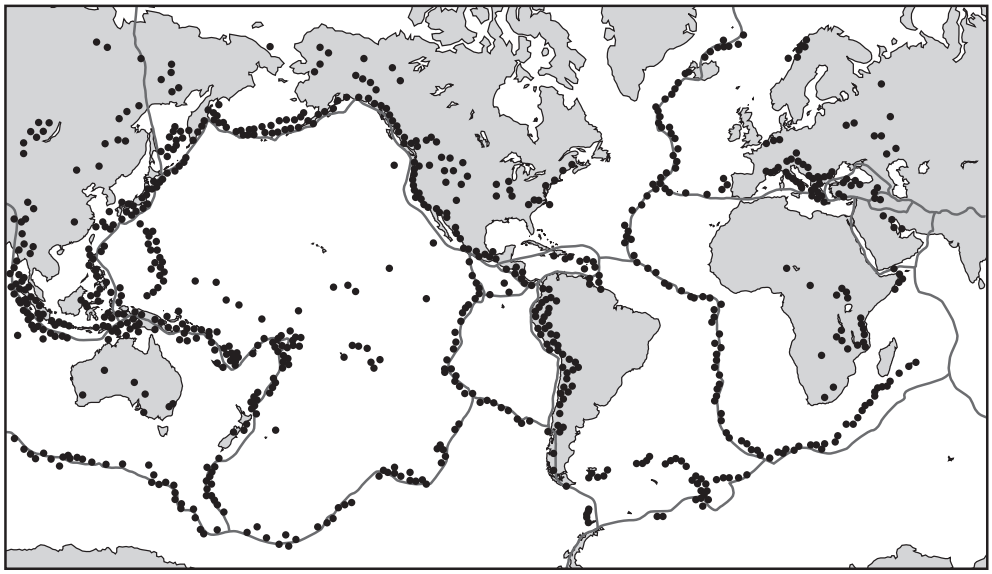
(a) What is the name given to these pieces of the Earth's crust?

Circle the correct answer.

earthquake **inner core** **mantle** **tectonic plates**

[1]

(b) Look at the map showing the positions of earthquakes around the world in 2021.



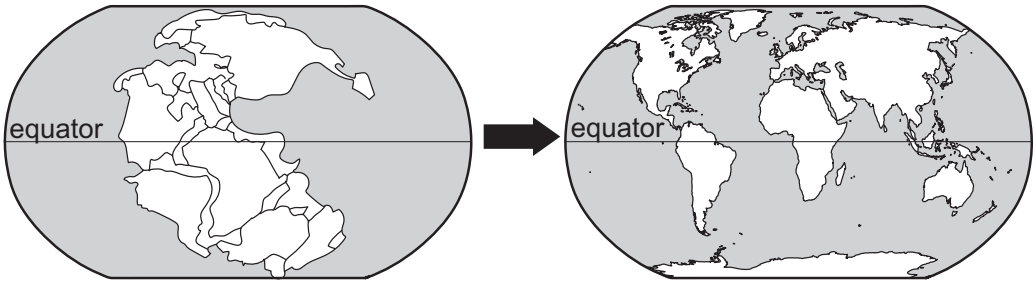
- earthquake

Suggest how the position of earthquakes provides evidence for the large pieces of the crust.

.....

..... [1]

(c) Look at the two maps showing the jigsaw appearance of the continental coasts.



3000 million years ago today

(i) What is meant by the **jigsaw appearance** of the continental coasts?

.....

..... [1]

(ii) The continents have moved since 3000 million years ago.

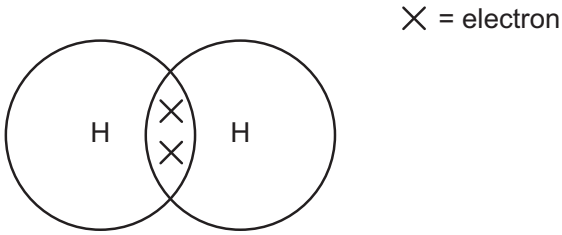
Explain how the continents move.

.....

.....

..... [2]

5 The diagram shows a model of a hydrogen molecule.



(a) Name the **type** of bonding in a hydrogen molecule.

.....

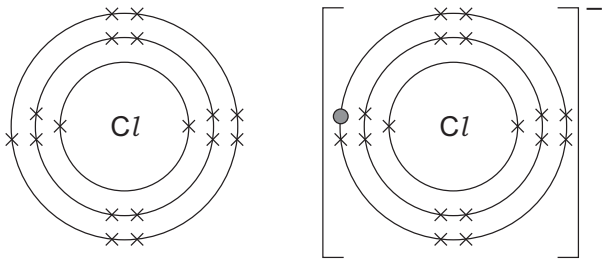
Explain how you can tell from the diagram.

.....

.....

[2]

(b) Look at the diagrams showing a chlorine atom and a chloride ion.



chlorine atom, Cl chloride ion, Cl^-

Describe how a chloride ion is made from a chlorine atom.

..... [1]

(c) Sodium chloride, NaCl, is made up of sodium ions, Na^+, and chloride ions, Cl^-.

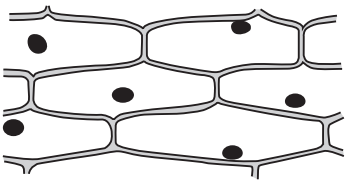
Explain how the ions in sodium chloride are held together.

.....

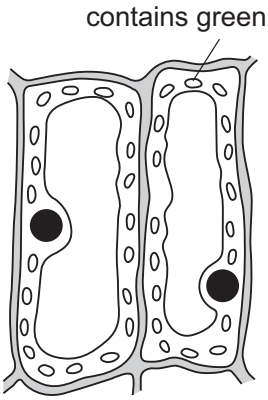
..... [1]

6 This is a question about photosynthesis and plant minerals.

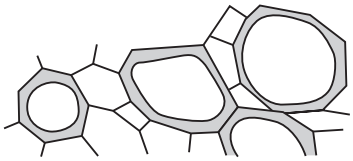
(a) Look at the diagrams of different plant cells.



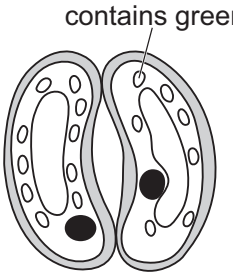
A onion epidermal cells



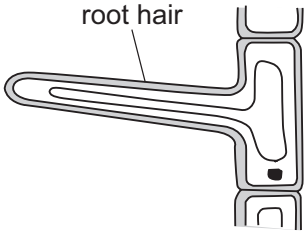
B palisade cells



C cells found in xylem



D guard cells



E epidermal cell in the root

Which **two** diagrams show plant cells that photosynthesise?

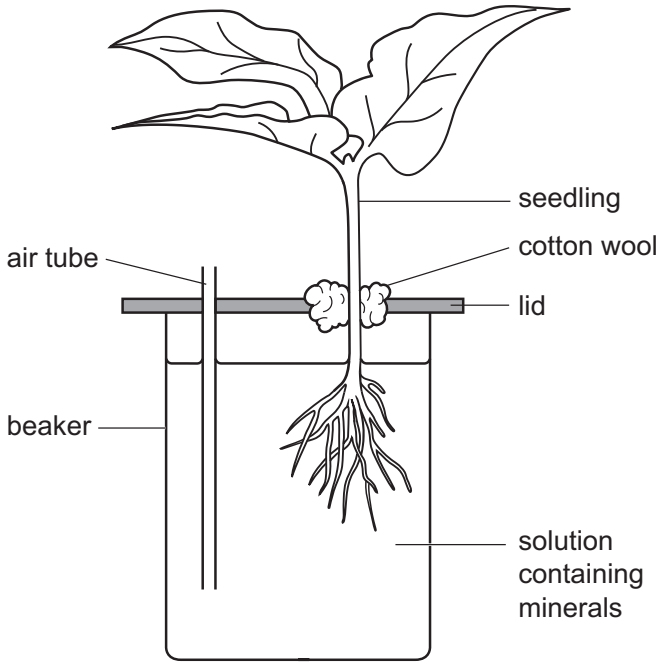
Choose from **A**, **B**, **C**, **D** and **E**.

..... and ..... [2]

(b) Carlos investigates the effect of magnesium on plant growth.

Carlos makes a hypothesis about the effect of magnesium on plant growth.

He uses the equipment in the diagram.



In his first experiment Carlos:

- fills a beaker with a solution containing all the minerals needed for healthy growth
- assembles the equipment and seedling as shown in the diagram
- records the appearance of the seedling after four weeks.

Carlos repeats the experiment.

In his second experiment, he uses a solution that contains all the minerals needed for healthy growth **except** magnesium.

(i) Carlos makes a hypothesis about the effect of magnesium on plant growth.

Suggest a suitable hypothesis.

.....

..... [1]

(ii) In his first experiment, Carlos uses a solution with all the minerals needed for healthy growth.

Explain why this is important.

.....

..... [1]

(c) Carlos draws a diagram to show the appearance of the plant from the first experiment after four weeks.

seedling in first experiment after four weeks

Carlos repeats his experiment again.

In his third experiment, he uses a solution that contains all the minerals needed for healthy growth **except** nitrates.

Predict the appearance of the seedling left in the solution **without** nitrates after four weeks.

Give a reason for your answer.

.....

.....

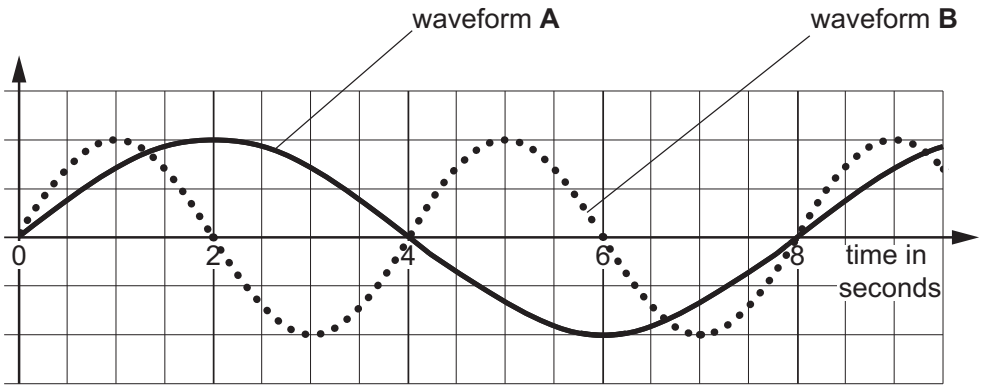
..... [2]

(d) Which substance is made inside chloroplasts?

..... [1]

7 Ahmed hears two sounds, **A** and **B**.

Look at the waveforms for these two sounds.



Give **one similarity** and **one difference** between waveform **A** and waveform **B**.

similarity .....

difference .....

[2]

8 When asteroids collide with the Earth, they make craters.

Chen uses a model to investigate the effect of asteroid collisions with the Earth.

In his investigation Chen:

- drops a rock into a container of soil
- measures the size of the hole in the soil made by the rock.

(a) Complete the sentences about Chen's model.

In the model the rock represents .....

In the model the soil represents .....

In the model the hole represents .....

[2]

(b) Write down **one strength** and **one limitation** of his model of asteroid collisions with the Earth.

strength .....

.....

limitation .....

.....

[2]

9 Myxomatosis is a disease that kills rabbits.

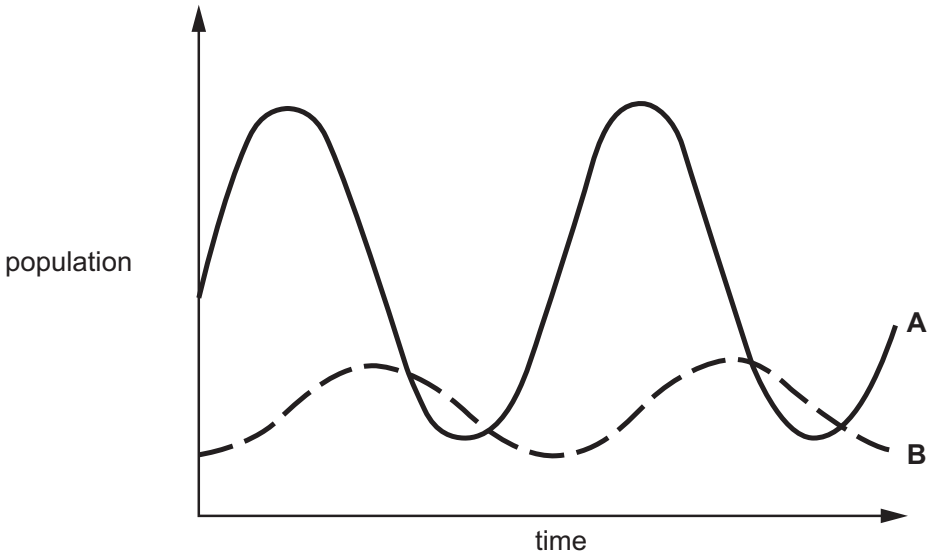
(a) Describe the effect of myxomatosis on the size of a rabbit population.

.....

[1]

(b) Foxes hunt rabbits for food.

The graph shows the population of foxes and the population of rabbits.



Tick (✓) the box that shows the population of rabbits.

line **A** ☐ line **B** ☐

Give **two** reasons for your answer.

1 .....

.....

2 .....

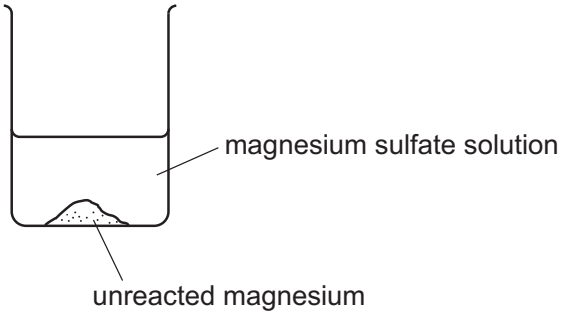
.....

[2]

10 Blessy makes some magnesium sulfate.

She adds an excess of magnesium to some dilute sulfuric acid until the reaction stops.

Unreacted magnesium is left at the bottom of the solution.



(a) Describe how Blessy separates the magnesium sulfate solution from the unreacted magnesium.

.....

.....

.....

[1]

(b) Blessy wants to make solid magnesium sulfate from the magnesium sulfate solution.

Describe how she makes solid magnesium sulfate.

.....

.....

.....

[1]

(c) Blessy now wants to make zinc chloride.

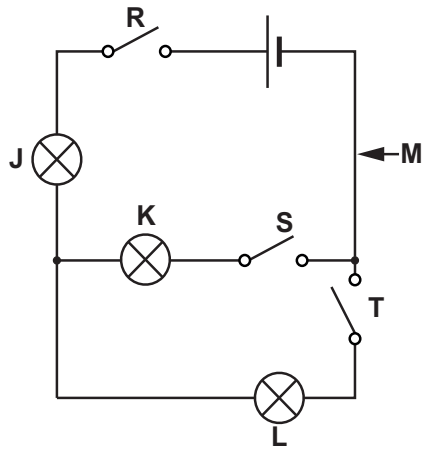
Write down the name of the **metal** and **acid** she uses to make zinc chloride.

metal .....

acid .....

[1]

11 The circuit diagram shows the circuit Priya makes using switches and identical lamps.



(a) Priya connects a meter to measure the current at position **M** in the circuit.

Draw the correct symbol for the meter she uses to measure the current.

..... [1]

(b) Priya opens and closes different switches.

Complete the table by writing if the:

- switches are **open** or **closed**
- lamps are **on** or **off**.

switch R	switch S	switch T	lamp J	lamp K	lamp L
closed	open	open	off	.....	.....
open	closed	closed	.....	off	.....
.....	.....	.....	on	off	on

[3]

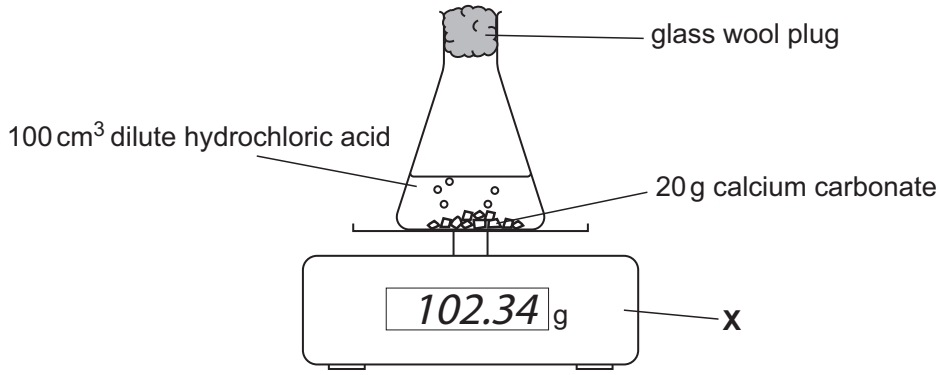
(c) Describe how Priya connects a voltmeter to measure the voltage across lamp **J**.

..... [1]

12 Pierre investigates the reaction between calcium carbonate and dilute hydrochloric acid.

The reaction gives off carbon dioxide gas.

Look at the equipment he uses.

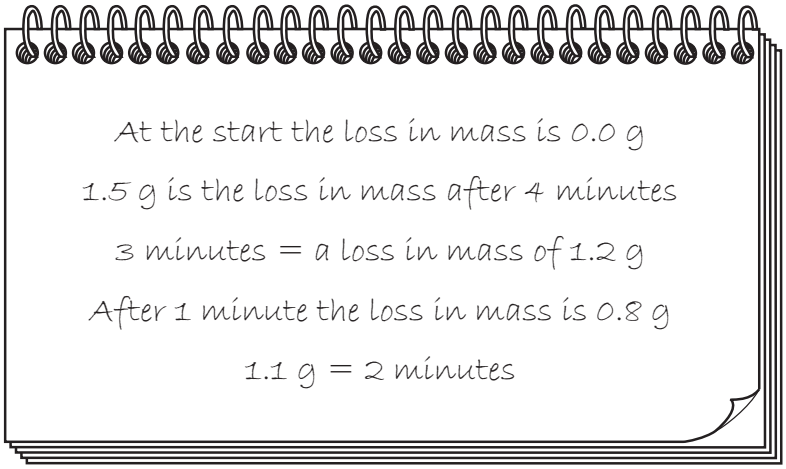


(a) Write down the name of equipment **X**.

..... [1]

(b) Pierre measures the loss in mass every minute for 4 minutes.

Here are his results.



Complete his results table.

....	**loss in mass in g**
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

[2]

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The Periodic Table of Elements

Group																	
1	2											3	4	5	6	7	8
							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 –

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 –