Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

PHYSICAL SCIENCE **0652/11**

Paper 1 Multiple Choice **October/November 2014**

45 minutes

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

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.

IB14 11_0652_11/3RP

1 A substance was heated until it completely melted.

The substance began melting when the temperature reached 120 °C and continued melting until the temperature reached 123 °C.

What is the substance?

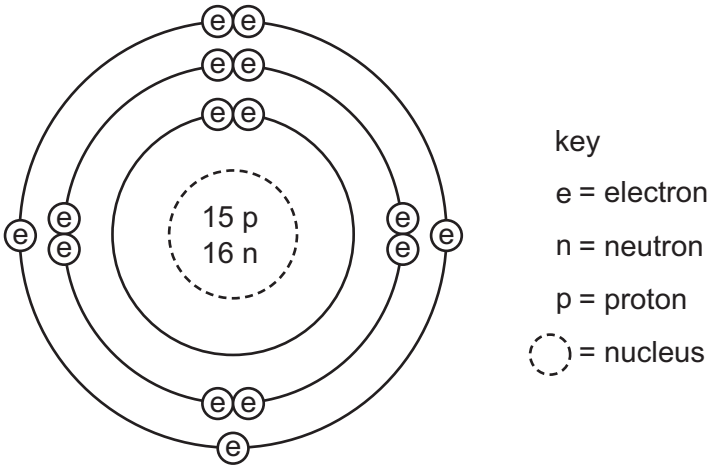
A a compound

B a metal

C a mixture

D an element

2 The diagram shows the structure of an atom.



What are the nucleon number and proton number of the atom?

	nucleon number	proton number
A	15	30
B	16	31
C	31	15
D	31	16

3 The table shows the electronic structure of four atoms.

atom	W	X	Y	Z
electronic structure	2,8,1	2,7	2,8	2,1

Which of the atoms combine with chlorine to form an ionic compound?

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

4 What is the relative formula mass of $CuSO_4.5H_2O$?

A 178 **B** 186 **C** 212 **D** 250

5 Which statement about exothermic reactions is correct?

A Energy is always absorbed during the reaction.

B Energy is always released during the reaction.

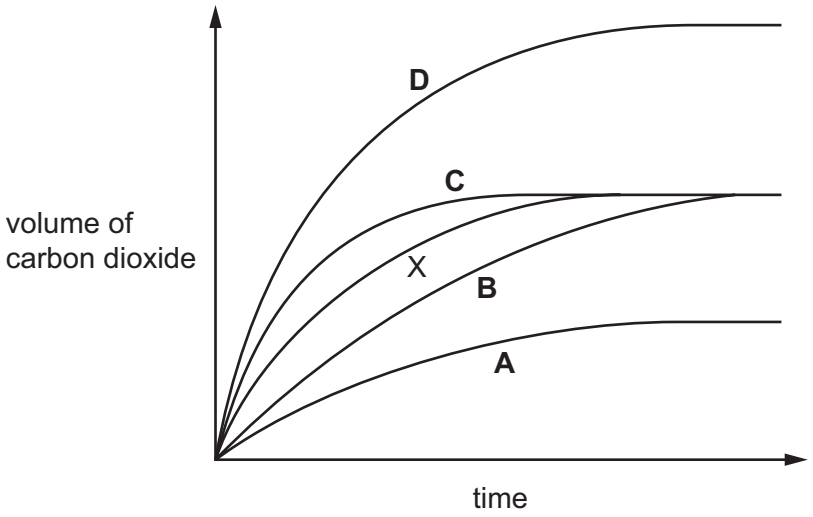
C Only the breaking of chemical bonds occurs in the reaction.

D The temperature of the surroundings drops during the reaction.

6 When hydrochloric acid is added to calcium carbonate, carbon dioxide gas is given off.

The volume of carbon dioxide plotted against time is represented by line X on the graph below.

Which line on the graph shows the results when the temperature of the mixture is increased and other factors remain the same?



7 The equation for the reaction of magnesium with copper(II) oxide is shown.

$$CuO + Mg \rightarrow MgO + Cu$$

Which statement is correct?

A Copper(II) oxide is oxidised.

B Copper(II) oxide is reduced.

C Magnesium oxide is oxidised.

D Magnesium oxide is reduced.

8 An element X is burnt in oxygen.

A solid oxide is produced which dissolves in water to form a solution of pH 13.

What is X?

A carbon

B phosphorus

C sodium

D sulfur

9 A sample of copper(II) chloride is mixed with ammonia solution until the ammonia is in excess.

A separate sample of copper chloride solution is mixed with acidified silver nitrate solution.

Which observations are correct?

	excess ammonia solution	acidified silver nitrate solution
A	blue precipitate	colourless solution
B	blue precipitate	white precipitate
C	blue solution	colourless solution
D	blue solution	white precipitate

10 Which row describes the Group VII element bromine?

	formula of molecule	reaction with potassium iodide solution
A	Br_2	displaces iodine
B	Br_2	no reaction
C	Br	displaces iodine
D	Br	no reaction

11 Copper is a metal and has the following properties.

1 It conducts heat.

2 It is hard.

3 It has a high density.

4 It is malleable.

Sodium is a metal in Group I of the Periodic Table.

Which metallic properties are shown by sodium?

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

12 Metal M is only present as a compound in its ores.

M is extracted from these compounds by heating with carbon.

In which position in the reactivity series shown is M found?

potassium
A
sodium
calcium
B
magnesium
zinc
C
iron
copper
D

13 Metals are found either as an ore or 'native' in the Earth's crust.

Which row identifies a source of aluminium, copper, gold and iron?

	aluminium	copper	gold	iron
A	bauxite	malachite	native	haematite
B	bauxite	native	malachite	haematite
C	haematite	malachite	native	bauxite
D	haematite	native	native	bauxite

14 Which colour change is observed when water is added to anhydrous copper(II) sulfate?

A blue to pink

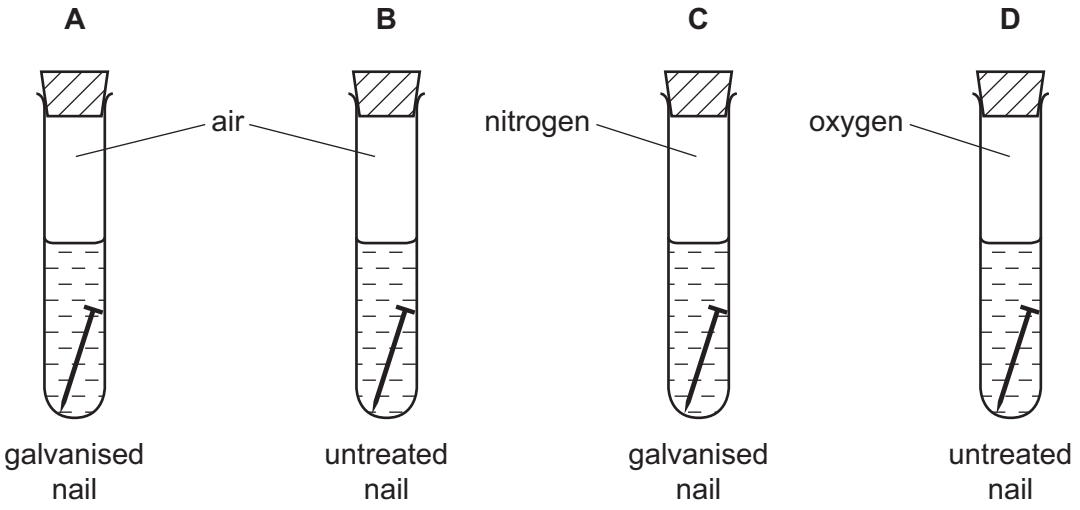
B blue to white

C pink to blue

D white to blue

15 Four test tubes containing water, different iron nails and different gases are shown.

In which tube does the nail rust most quickly?



16 A farmer tests the pH of his soil.

The pH is 5 so the farmer adds some slaked lime (calcium hydroxide).

Why does the farmer add slaked lime to his soil?

A because slaked lime is an acid

B because calcium is a reactive metal

C to fertilise the soil

D to neutralise the soil

17 Which products are formed when limestone is heated?

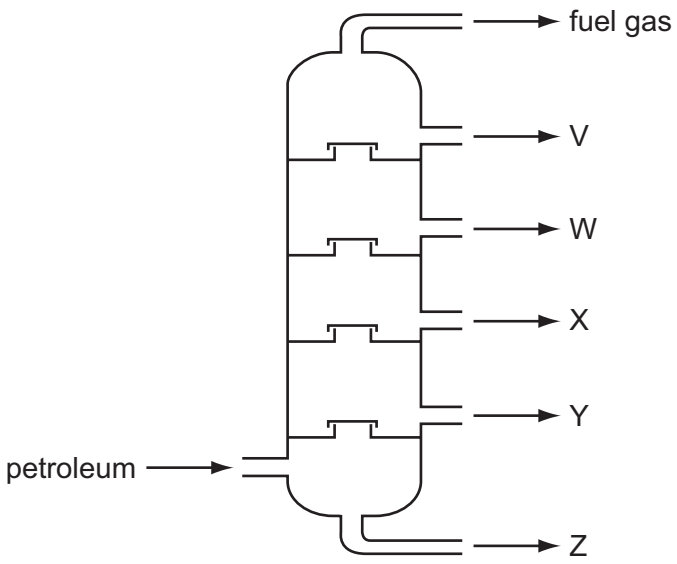
A carbon dioxide, lime and oxygen

B carbon dioxide and lime only

C carbon dioxide and slaked lime

D lime and slaked lime

18 The diagram shows the fractional distillation of petroleum.



Which row shows the correct use for the fraction?

	fraction	use
A	V	aircraft fuel
B	W	making roads
C	X	diesel fuel
D	Z	making polishes and waxes

19 Which statement about ethene is **not** correct?

A It contains a double bond.

B It is a hydrocarbon.

C It is saturated.

D It will decolourise bromine water.

20 Which is **not** a use of ethanol?

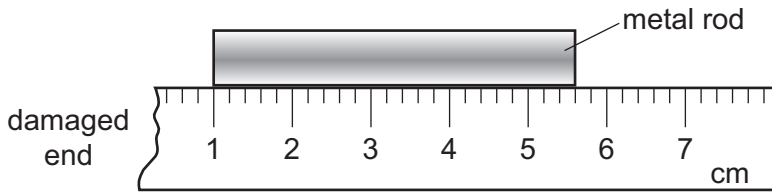
A lubricant

B motor fuel

C part of beer

D solvent in paint

21 A girl uses a rule to measure the length of a metal rod. The end of the rule is damaged so she places one end of the rod at the 1 cm mark as shown.



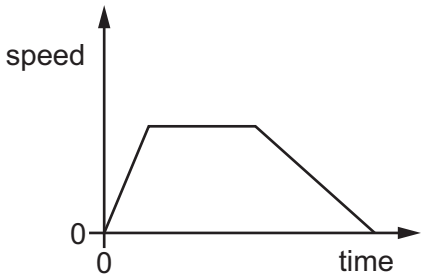
How long is the metal rod?

A 43 mm **B** 46 mm **C** 53 mm **D** 56 mm

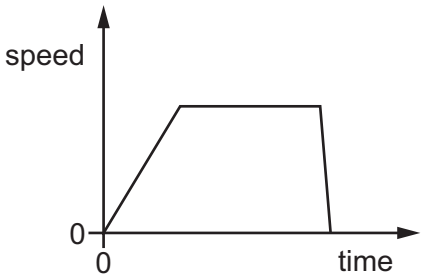
22 A car accelerates uniformly from rest. It then travels at constant speed for a certain time and finally it stops suddenly.

Which diagram represents the speed / time graph for the motion of the car?

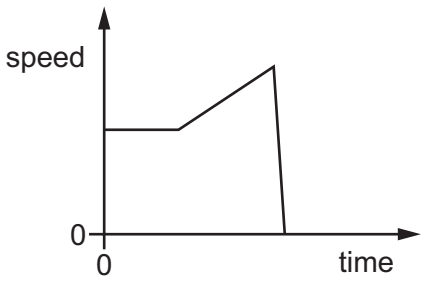
A



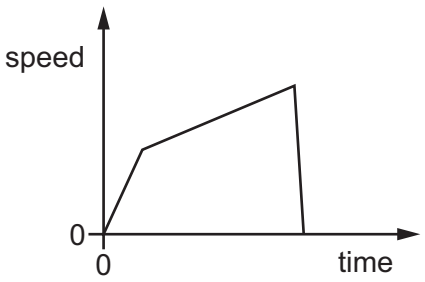
B



C



D



23 Which property of a body is measured in newtons?

A energy

B power

C volume

D weight

24 A metal container has a mass of 200 kg.

When the container is filled with 1.0 m^3 of a liquid, the total mass is 1000 kg.

What is the density of the liquid?

A 0.00125 kg / m^3

B 0.00500 kg / m^3

C 800 kg / m^3

D 1000 kg / m^3

25 Fuels are a source of energy in many power stations.

How is chemical energy in fuels released?

A conversion from gravitational energy

B conversion from strain energy

C fission of heavy atoms

D regrouping of atoms

26 Three properties of a body are its mass, its shape and its size.

Which row shows the properties that can be changed by a force?

	mass	shape	size
A	✓	✓	✓
B	✓	✓	✗
C	✓	✗	✓
D	✗	✓	✓

key

✓ = can be changed

✗ = cannot be changed

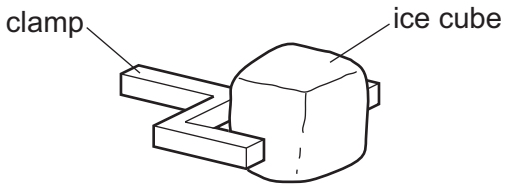
27 The table lists the melting points and the boiling points of four different substances.

Which substance is a gas at 25 °C?

	melting point / °C	boiling point / °C
A	–219	–183
B	–7	58
C	98	890
D	1083	2582

[Turn over

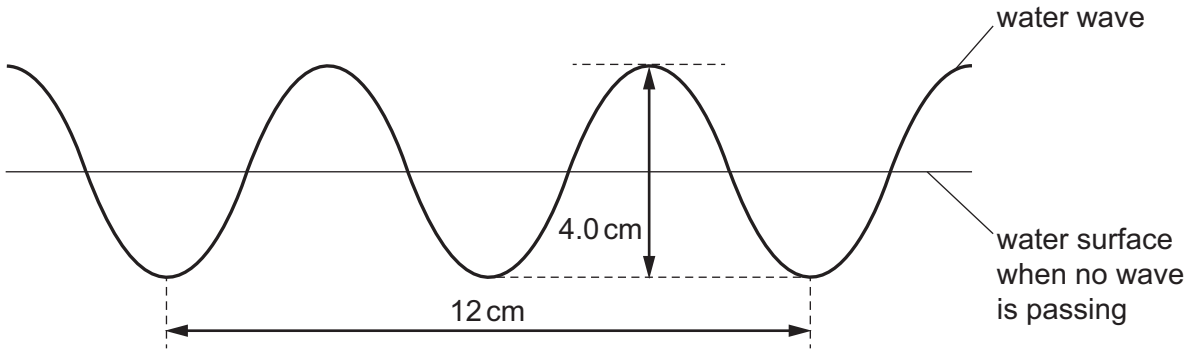
28 An ice cube is held in a clamp. The air next to the ice cube becomes very cold.



What happens to the density of the air as the air becomes colder and in which direction does the cold air move?

	density change of the air	direction the air moves
A	decreases	downwards
B	decreases	upwards
C	increases	downwards
D	increases	upwards

29 The diagram shows a water wave. The horizontal line represents the surface of the water when no wave is passing.



Which statement about the wave is correct?

A The amplitude of the wave is 2.0 cm.

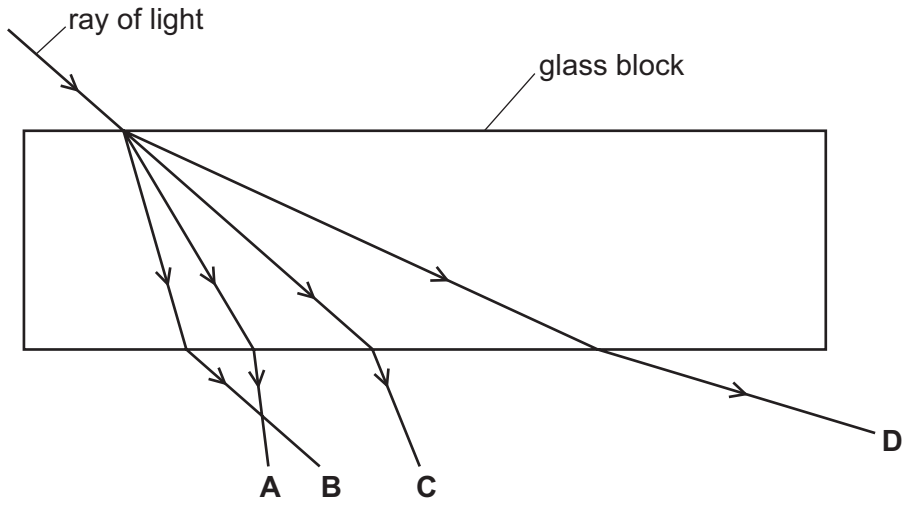
B The amplitude of the wave is 4.0 cm.

C The wavelength of the wave is 3.0 cm.

D The wavelength of the wave is 12 cm.

30 The diagram shows a ray of light incident on a glass block.

Which labelled arrow shows the ray after it has passed through the block?



31 The diagram shows the electromagnetic spectrum. Three sections have been labelled with their names.

Where should the label for infra-red be placed?

A	microwaves	**B**	visible light	**C**	**D**	gamma-rays

32 A loudspeaker produces waves with the following frequencies.

5 Hz 500 Hz 5000 Hz 50 000 Hz

Which frequencies can be heard by a person with normal hearing?

A 5 Hz, 500 Hz, 5000 Hz and 50 000 Hz

B 5 Hz, 500 Hz and 5000 Hz only

C 500 Hz, 5000 Hz and 50 000 Hz only

D 500 Hz and 5000 Hz only

33 Why is iron a suitable material for the core of an electro-magnet?

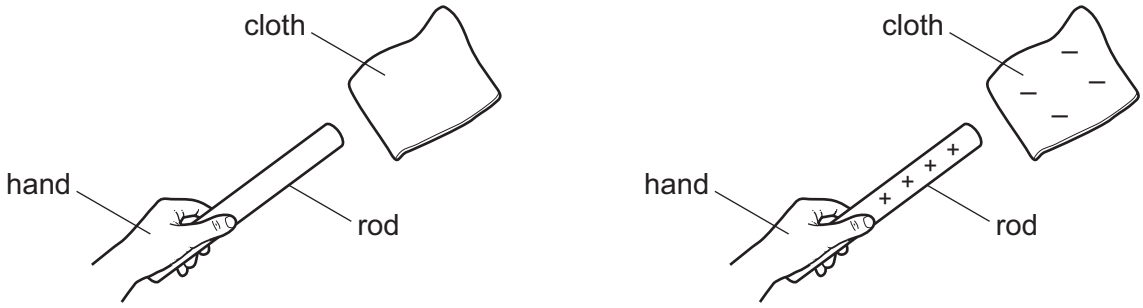
A It is a good conductor of electricity.

B It is a poor conductor of electricity.

C It loses its magnetism when the current is switched off.

D It stays magnetised when the current is switched off.

34 A student holds a rod in her hand. She rubs the rod with a cloth. The rod becomes positively charged, and the cloth becomes negatively charged.



before rubbing

after rubbing

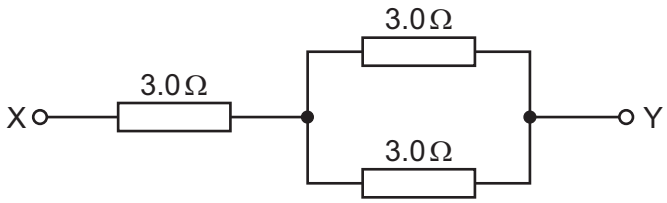
Which row shows whether the rod is an insulator or a conductor, and which charges move while the rod is rubbed with the cloth?

	rod	charges that move
A	conductor	negative
B	conductor	positive
C	insulator	negative
D	insulator	positive

35 Which row gives the unit for current and the unit for electromotive force (e.m.f.)?

	current	e.m.f.
A	ampere	newton
B	ampere	volt
C	volt	ampere
D	volt	newton

36 Three 3.0 Ω resistors are connected between point X and point Y, as shown.



What is the resistance between point X and point Y?

A 3.0 Ω

B between 3.0 Ω and 6.0 Ω

C between 6.0 Ω and 9.0 Ω

D 9.0 Ω

37 Domestic appliances use electricity in a variety of ways.

Which appliance includes both an electric motor and a heater?

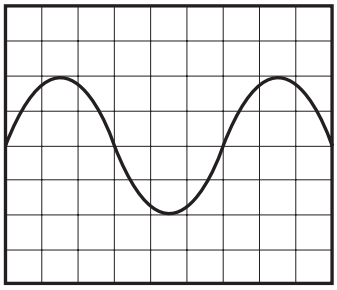
A hairdryer

B iron

C kettle

D vacuum cleaner

38 The diagram shows the trace on the screen of a cathode-ray oscilloscope.



To produce this trace, which row shows whether the time base is on or off, and which plates are connected to an external source of changing voltage (a.c.)?

	time base	a.c. supply connected to
A	off	x-plates
B	off	y-plates
C	on	x-plates
D	on	y-plates

39 What is a beta-particle and from which part of a radioactive atom is it emitted?

	beta-particle	emitted from
A	electron	nucleus
B	electron	outer shell
C	helium nucleus	nucleus
D	helium nucleus	outer shell

40 Two atoms are different isotopes of the same element.

Which statement about these atoms is correct?

A They have different numbers of electrons.

B They have different numbers of neutrons.

C They have different numbers of protons.

D They have the same number of nucleons.

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DATA SHEET
The Periodic Table of the Elements

Group																	
I	II									III	IV	V	VI	VII	0
															4 He Helium 2
					1 H Hydrogen 1										
7 Li Lithium 3	9 Be Beryllium 4									11 B Boron 5	12 C Carbon 6	14 N Nitrogen 7	16 O Oxygen 8	19 F Fluorine 9	20 Ne Neon 10
23 Na Sodium 11	24 Mg Magnesium 12									27 Al Aluminium 13	28 Si Silicon 14	31 P Phosphorus 15	32 S Sulfur 16	35.5 Cl Chlorine 17	40 Ar Argon 18
39 K Potassium 19	40 Ca Calcium 20	45 Sc Scandium 21	48 Ti Titanium 22	51 V Vanadium 23	52 Cr Chromium 24	55 Mn Manganese 25	56 Fe Iron 26	59 Co Cobalt 27	59 Ni Nickel 28	64 Cu Copper 29	65 Zn Zinc 30	70 Ga Gallium 31	73 Ge Germanium 32	75 As Arsenic 33	79 Se Selenium 34	80 Br Bromine 35	84 Kr Krypton 36
85 Rb Rubidium 37	88 Sr Strontium 38	89 Y Yttrium 39	91 Zr Zirconium 40	93 Nb Niobium 41	96 Mo Molybdenum 42	Tc Technetium 43	101 Ru Ruthenium 44	103 Rh Rhodium 45	106 Pd Palladium 46	108 Ag Silver 47	112 Cd Cadmium 48	115 In Indium 49	119 Sn Tin 50	122 Sb Antimony 51	128 Te Tellurium 52	127 I Iodine 53	131 Xe Xenon 54
133 Cs Caesium 55	137 Ba Barium 56	139 La Lanthanum 57 *	178 Hf Hafnium 72	181 Ta Tantalum 73	184 W Tungsten 74	186 Re Rhenium 75	190 Os Osmium 76	192 Ir Iridium 77	195 Pt Platinum 78	197 Au Gold 79	201 Hg Mercury 80	204 Tl Thallium 81	207 Pb Lead 82	209 Bi Bismuth 83	Po Polonium 84	At Astatine 85	Rn Radon 86
Fr Francium 87	226 Ra Radium 88	227 Ac Actinium 89 †															

*	140 Ce Cerium 58	141 Pr Praseodymium 59	144 Nd Neodymium 60	Pm Promethium 61	150 Sm Samarium 62	152 Eu Europium 63	157 Gd Gadolinium 64	159 Tb Terbium 65	162 Dy Dysprosium 66	165 Ho Holmium 67	167 Er Erbium 68	169 Tm Thulium 69	173 Yb Ytterbium 70	175 Lu Lutetium 71
†	232 Th Thorium 90	238 Pa Protactinium 91	U Uranium 92	Np Neptunium 93	Pu Plutonium 94	Am Americium 95	Cm Curium 96	Bk Berkelium 97	Cf Californium 98	Es Einsteinium 99	Fm Fermium 100	Md Mendelevium 101	No Nobelium 102	Lr Lawrencium 103

*58-71 Lanthanoid series
†90-103 Actinoid series

Key: a = relative atomic mass; X = atomic symbol; b = proton (atomic) number

The volume of one mole of any gas is 24 dm^3 at room temperature and pressure (r.t.p.).