

**COMBINED SCIENCE**

**5129/11**

Paper 1 Multiple Choice

**October/November 2014**

**1 hour**

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.

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

- 1 Cell P and cell Q are animal cells.

Cell P is placed into a concentrated salt solution.

Cell Q is placed into distilled (pure) water.

What is the appearance of the two cells after ten minutes?

	cell P	cell Q
<b>A</b>	burst	burst
<b>B</b>	burst	shriveled
<b>C</b>	shriveled	burst
<b>D</b>	shriveled	shriveled

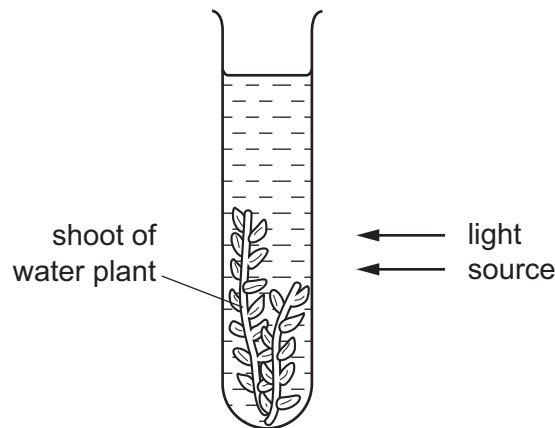
- 2 Every seed contains a food reserve.

What makes this food available to the young plant at germination?

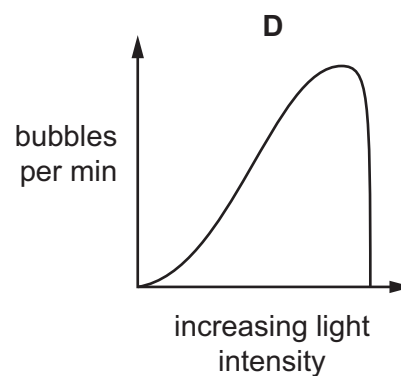
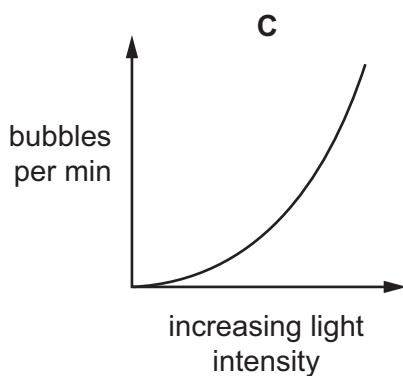
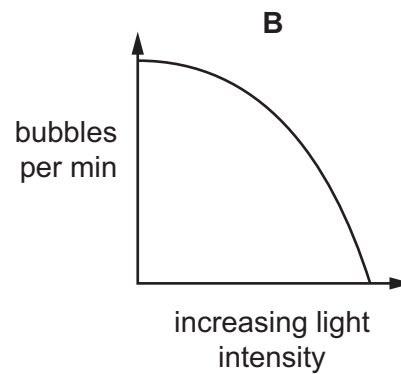
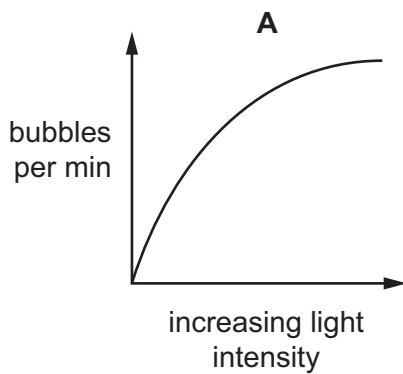
- A** cellulose
- B** chlorophyll
- C** enzymes
- D** lactic acid

- 3 The diagram shows an investigation into the effect of light intensity on the rate of photosynthesis. The rate is measured by counting the number of bubbles released per minute.

The experiment is repeated using different light intensities.



Which graph shows the result of the investigation?



- 4 Which statement describes the effect of a lack of nitrogen on plants?
- A** faster root growth and purple leaves
  - B** faster root growth and yellow leaves
  - C** poor plant growth and purple leaves
  - D** poor plant growth and yellow leaves

5 When a child sucks a sweet it may stay in their mouth for some time.

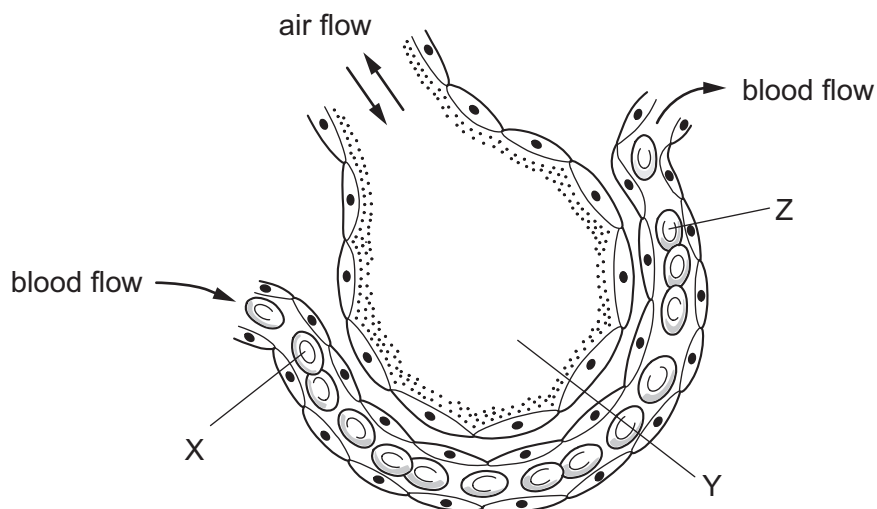
How does this contribute to tooth decay?

- A The sugar in the sweet stops bacteria from growing.
- B The teeth are damaged by acid being produced in the mouth.
- C The teeth are damaged by alkali being produced in the mouth.
- D The teeth are damaged by artificial flavourings in the sweet.

6 Which row does **not** correctly link a component of blood and its function?

	component of blood	function
A	plasma	transports urea
B	platelets	blood clotting
C	red blood cells	transport oxygen
D	white blood cells	transport CO <sub>2</sub>

7 The diagram shows a section through an alveolus and a blood capillary.



Which row describes the oxygen concentrations at X, Y and Z?

	X	Y	Z
A	high	low	high
B	high	low	low
C	low	high	high
D	low	high	low

8 What is the excretory product in blood that is removed by the lungs?

- A carbon dioxide
- B glucose
- C lactic acid
- D urea

9 Which processes take place in the eye when a person moves into dim light?

	size of pupil	circular muscles of iris	radial muscles of iris
A	enlarges	contract	relax
B	enlarges	relax	contract
C	reduces	contract	relax
D	reduces	relax	contract

10 What is **not** an effect of excessive alcohol consumption?

- A addiction
- B depression
- C lack of self control
- D quicker reaction times

11 What is the main source of energy for food webs?

- A chemical reactions
- B heat from the centre of the Earth
- C heat from the Sun
- D light from the Sun

12 Which are results of deforestation in tropical rainforests?

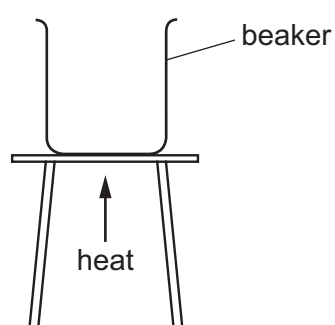
- A increased atmospheric carbon dioxide and decreased biodiversity
- B increased atmospheric carbon dioxide and increased biodiversity
- C increased atmospheric oxygen and decreased biodiversity
- D increased atmospheric oxygen and increased biodiversity

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

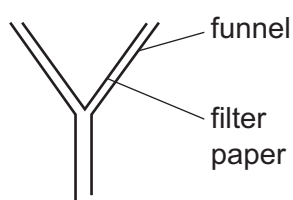
	diet	stress
<b>A</b>	balanced	high
<b>B</b>	balanced	low
<b>C</b>	unbalanced	high
<b>D</b>	unbalanced	low

14 Powdered magnesium carbonate is slowly added to dilute sulfuric acid.

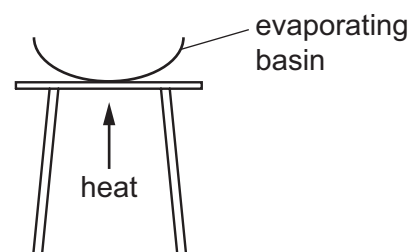
Which pieces of apparatus are needed to continue the experiment to obtain a sample of magnesium sulfate crystals?



1



2



3

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

15 An atom of sodium is represented by  ${}_{11}^{23}\text{Na}$ .

What are the numbers of neutrons and protons in this atom?

	number of neutrons	number of protons
<b>A</b>	11	12
<b>B</b>	12	11
<b>C</b>	23	11
<b>D</b>	23	12

16 Which atom forms an ion with a charge of 2+?

	proton (atomic) number
<b>A</b>	6
<b>B</b>	8
<b>C</b>	12
<b>D</b>	16

17 The table shows the electronic structure of four elements.

element	electronic structure
W	2,6
X	2,8
Y	2,8,1
Z	2,8,7

Which pair of atoms form a covalent molecule?

- A** two atoms of W
- B** two atoms of X
- C** an atom of W and an atom of X
- D** an atom of Y and an atom of Z

18 Which formula has the greatest number of atoms?

- A**  $\text{Ca}_3(\text{PO}_4)_2$
- B**  $\text{Cu}(\text{CH}_3\text{COO})_2$
- C**  $\text{Fe}_2(\text{SO}_4)_3$
- D**  $(\text{NH}_4)_2\text{CO}_3$

19 An element forms an amphoteric oxide.

Which substances will react with this amphoteric oxide?

	acids	alkalis
<b>A</b>	✓	✓
<b>B</b>	✓	x
<b>C</b>	x	✓
<b>D</b>	x	x

key

✓ = reacts

x = does not react

20 An element X from Period 2 in the Periodic Table is heated in air.

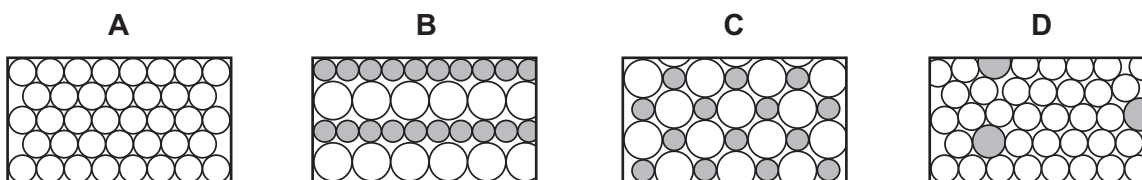
It forms an oxide which dissolves in water.

Universal Indicator added to the solution turns blue.

Which row describes element X?

	metal or non-metal	position in the period
<b>A</b>	metal	on the left side
<b>B</b>	metal	on the right side
<b>C</b>	non-metal	on the left side
<b>D</b>	non-metal	on the right side

21 Which diagram represents the structure of an alloy?



22 Part of the reactivity series of metals is given below.

barium  
calcium  
magnesium  
chromium  
iron  
copper  
palladium  
platinum

Which statement is **not** correct?

- A** Barium will not react with cold water but will react with steam.
- B** Chromium will react with dilute hydrochloric acid.
- C** Palladium will not react with cold water or steam.
- D** Platinum will not react with dilute hydrochloric acid.



23 Which two gases are both pollutants of the atmosphere?

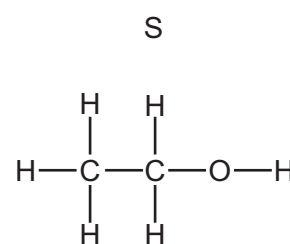
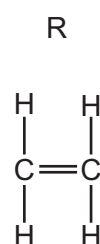
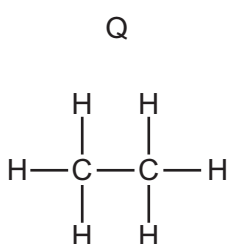
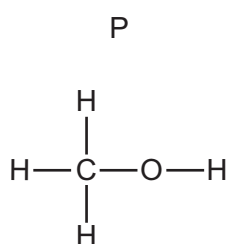
- A carbon monoxide and oxygen
- B carbon monoxide and sulfur dioxide
- C nitrogen and oxygen
- D nitrogen and sulfur dioxide

24 Ammonia is made in the Haber process.

Which conditions are used in the Haber process?

	temperature / °C	pressure / atm	catalyst
<b>A</b>	200	450	aluminium oxide
<b>B</b>	200	450	iron
<b>C</b>	450	200	aluminium oxide
<b>D</b>	450	200	iron

25 The diagrams show the structures of four organic molecules.



Which two are members of the same homologous series?

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

26 Which statement about alkenes is **not** correct?

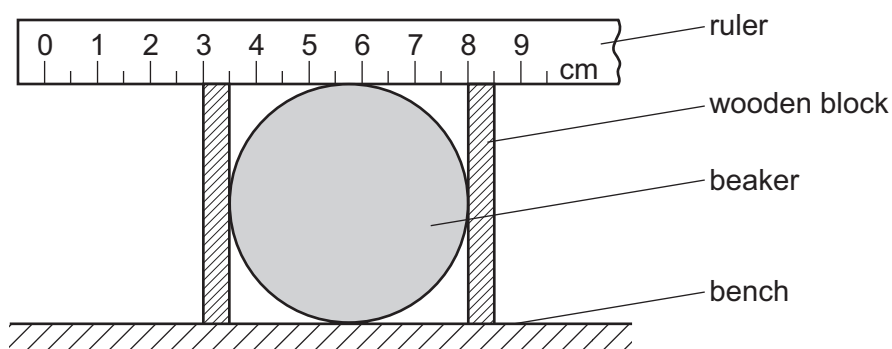
- A Alkenes are made by cracking.
- B Alkenes are saturated compounds.
- C Alkenes contain carbon-carbon double bonds.
- D Alkenes turn bromine water colourless.

27 The properties of ethanol make it a very useful substance.

Which statement is **not** correct?

- A Ethanol burns to form carbon dioxide and water and is often used as a fuel.
- B Ethanol can be formed from sugar and is found in wine.
- C Ethanol is a useful solvent because it is able to dissolve many different substances.
- D Ethanol is very slippery and so is used as a lubricant.

28 The diagram shows a method of measuring the diameter of a beaker.



What is the diameter of the beaker?

- A 4.5 cm
- B 5.0 cm
- C 5.5 cm
- D 8.0 cm

29 The gradient of the line on a graph gives the acceleration of a moving object.

What are the quantities on the horizontal and vertical axes of this graph?

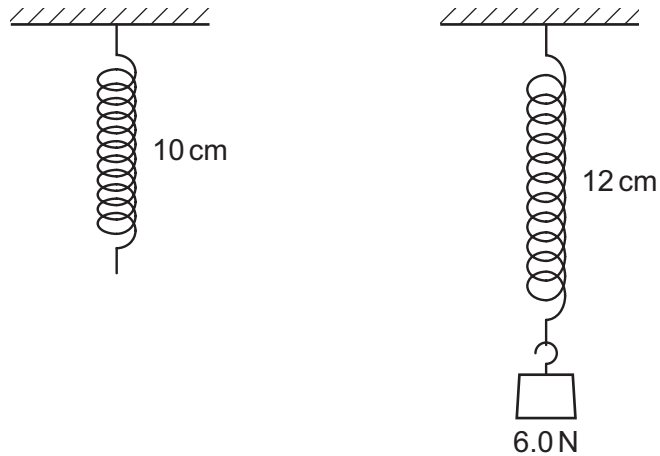
	quantity on horizontal axis	quantity on vertical axis
A	speed	distance
B	speed	time
C	time	distance
D	time	speed

30 An unbalanced force is applied to a moving object.

Which statement does **not** describe the possible motion of the object?

- A the object accelerates
- B the object's direction alters
- C the object's speed decreases
- D the object's velocity remains constant

31 The diagrams show how a spring extends when a weight of 6.0 N is hung on it.



Which weight hanging from the spring causes the length to become 15 cm?

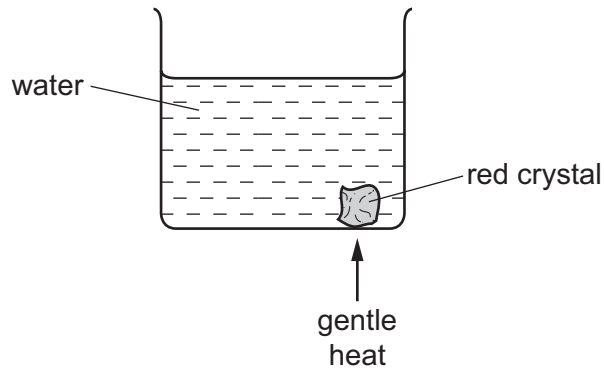
- A** 7.5 N      **B** 15 N      **C** 30 N      **D** 45 N

32 Which type of energy is converted to thermal energy when **atoms** combine?

- A** chemical  
**B** kinetic  
**C** nuclear  
**D** solar

33 A beaker of water contains a red crystal which is slowly dissolving.

Gentle heat is applied below the crystal.



The red colour rises.

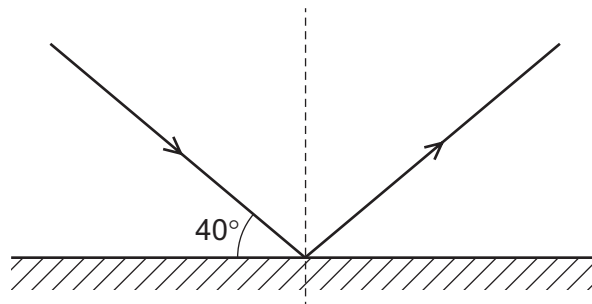
What is the name of this process?

- A conduction
- B convection
- C evaporation
- D radiation

34 Which line in the table shows examples of transverse and longitudinal waves?

	transverse	longitudinal
<b>A</b>	gamma-rays	light
<b>B</b>	infra-red	sound
<b>C</b>	radio	water waves
<b>D</b>	sound	X-rays

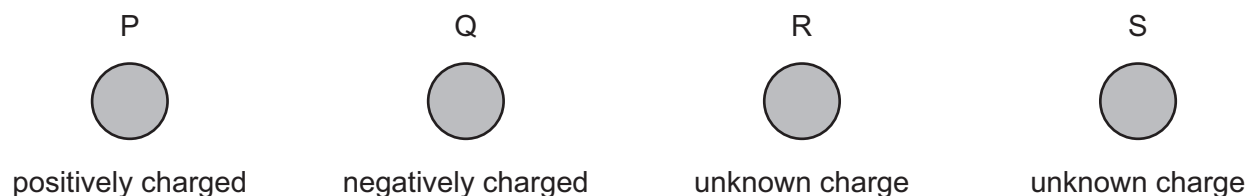
35 The ray diagram shows light reflecting off a plane mirror.



What is the angle between the incident and reflected rays?

- A  $40^\circ$
- B  $50^\circ$
- C  $80^\circ$
- D  $100^\circ$

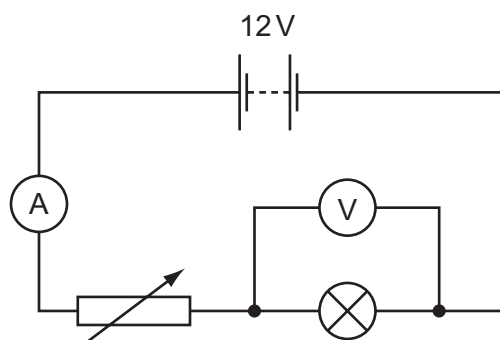
36 The diagram shows four charged objects, P, Q, R and S.



It is found that P attracts R but repels S.

Which statement is correct?

- A Q attracts R.
  - B Q repels S.
  - C R attracts S.
  - D R repels S.
- 37 The circuit shown is used to determine the resistance of a lamp for two different brightness settings.



When the lamp brightness is low, the voltmeter reading is 2V and the ammeter reading is 2A.

When the lamp brightness is normal, the readings are 12V and 4A.

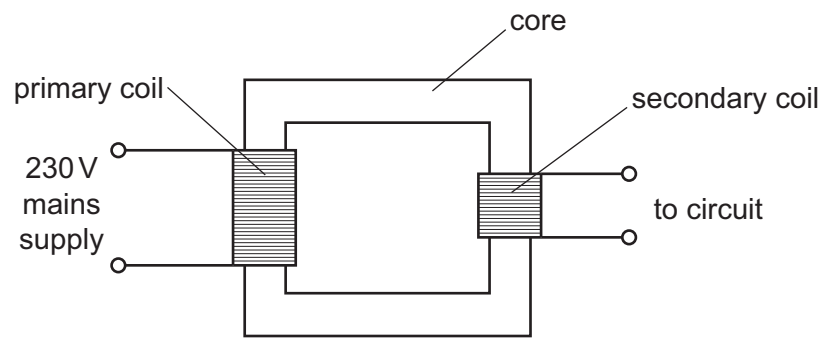
What was the increase in filament resistance?

- A  $1\ \Omega$
  - B  $2\ \Omega$
  - C  $3\ \Omega$
  - D  $4\ \Omega$
- 38 A 750W microwave oven is used in a house where the mains voltage is 240V.

Which fuse should be used in the plug?

- A 3A
- B 5A
- C 10A
- D 13A

39 The diagram shows a transformer.



There is a current in the primary coil and another current in the secondary coil.

Why is there a current in the secondary coil?

- A because electricity is conducted through the core
  - B because the current in the primary coil does not change
  - C because there are more turns on the primary coil than on the secondary coil
  - D because there is a changing magnetic field in the core
- 40 The count rate produced by a source containing a radioactive nuclide falls from 1200 to 75 in 3 minutes.

What is the half-life of the radioactive nuclide?

- A 0.75 minutes
- B 1.0 minutes
- C 3.0 minutes
- D 12.0 minutes



**DATA SHEET**  
**The Periodic Table of the Elements**

		Group											
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
7 <b>Li</b> Lithium 3	9 <b>Be</b> Beryllium 4	1 <b>H</b> Hydrogen 1										4 <b>He</b> Helium 2	
23 <b>Na</b> Sodium 11	24 <b>Mg</b> Magnesium 12	11 <b>B</b> Boron 5	12 <b>C</b> Carbon 6	13 <b>Al</b> Aluminium 13	14 <b>Si</b> Silicon 14	15 <b>P</b> Phosphorus 15	16 <b>S</b> Sulfur 16	17 <b>Cl</b> Chlorine 17	18 <b>Ar</b> Argon 18	19 <b>F</b> Fluorine 9	20 <b>Ne</b> Neon 10		
39 <b>K</b> Potassium 19	40 <b>Ca</b> Calcium 20	27 <b>Al</b> Aluminium 13	28 <b>Si</b> Silicon 14	29 <b>Co</b> Cobalt 27	30 <b>Zn</b> Zinc 30	31 <b>Ga</b> Gallium 31	32 <b>Ge</b> Germanium 32	33 <b>As</b> Arsenic 33	34 <b>Se</b> Selenium 34	35 <b>Br</b> Bromine 35	36 <b>Kr</b> Krypton 36		
85 <b>Rb</b> Rubidium 37	88 <b>Sr</b> Strontium 38	55 <b>Mn</b> Manganese 25	56 <b>Fe</b> Iron 26	59 <b>Co</b> Cobalt 27	64 <b>Cu</b> Copper 29	70 <b>Ga</b> Gallium 31	73 <b>Ge</b> Germanium 32	75 <b>As</b> Arsenic 33	79 <b>Se</b> Selenium 34	80 <b>Br</b> Bromine 35	84 <b>Kr</b> Krypton 36		
133 <b>Cs</b> Caesium 55	137 <b>Ba</b> Barium 56	91 <b>Zr</b> Zirconium 40	93 <b>Nb</b> Niobium 41	96 <b>Mo</b> Molybdenum 42	106 <b>Pd</b> Palladium 46	115 <b>In</b> Indium 49	119 <b>Sn</b> Tin 50	122 <b>Sb</b> Antimony 51	128 <b>Te</b> Tellurium 52	127 <b>I</b> Iodine 53	131 <b>Xe</b> Xenon 54		
226 <b>Ra</b> Radium 88	227 <b>Ac</b> Actinium 89	59 <b>Pr</b> Praseodymium 59	60 <b>Nd</b> Neodymium 60	61 <b>Pm</b> Promethium 61	63 <b>Eu</b> Europium 63	66 <b>Dy</b> Dysprosium 66	67 <b>Ho</b> Holmium 67	68 <b>Er</b> Erbium 68	69 <b>Tm</b> Thulium 69	70 <b>Yb</b> Ytterbium 70	71 <b>Lu</b> Lutetium 71		
87 <b>Fr</b> Francium	88 <b>Ra</b> Radium	140 <b>Ce</b> Cerium 58	141 <b>Pr</b> Praseodymium 59	144 <b>Nd</b> Neodymium 60	152 <b>Eu</b> Europium 63	159 <b>Tb</b> Terbium 65	165 <b>Ho</b> Holmium 67	167 <b>Er</b> Erbium 68	169 <b>Tm</b> Thulium 69	173 <b>Yb</b> Ytterbium 70	175 <b>Lu</b> Lutetium 71		
87 <b>Fr</b> Francium	88 <b>Ra</b> Radium	90 <b>Th</b> Thorium 90	91 <b>Pa</b> Protactinium 91	92 <b>U</b> Uranium 92	95 <b>Am</b> Americium 95	97 <b>Bk</b> Berkelium 97	99 <b>Es</b> Einsteinium 99	100 <b>Fm</b> Fermium 100	101 <b>Md</b> Mendelevium 101	102 <b>No</b> Nobelium 102	103 <b>Lr</b> Lawrencium 103		

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

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

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

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