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CHEMISTRY **0620/13**

Paper 1 Multiple Choice (Core) **May/June 2026**

45 minutes

4793200777

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 or tape.
- 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.
- Any rough working should be done on this question paper.
- The Periodic Table is printed in the question paper.

This document has **16** pages. Any blank pages are indicated.

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[Turn over

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1 Which statement about solids, liquids or gases is correct?

A Liquids are easy to compress.

B Solids are easy to compress.

C Gases expand to fill their container.

D Liquids expand to fill their container.

2 Which statement describes a compound?

A It contains two or more elements chemically combined.

B It contains two or more elements physically combined.

C It contains two or more elements forming an alloy.

D It contains two or more elements that can easily be separated.

3 Four statements about particles in an atom are listed.

1 Protons and neutrons have the same relative mass and different relative charges.

2 Protons and neutrons have different relative masses and the same relative charge.

3 Protons and electrons have the same relative mass and different relative charges.

4 Protons and electrons have different relative masses and different relative charges.

Which statements are correct?

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

4 Which statement about the atomic structure of the named element is correct?

A Antimony, Sb, has only four occupied electron shells.

B Selenium, Se, has only six electrons in its third electron shell.

C Strontium, Sr, has four outer-shell electrons.

D Xenon, Xe, has five fully occupied electron shells.

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5 An atom of element X has 20 protons and 20 neutrons.

An atom of element Y has 19 electrons and a nucleon number of 40.

Which statement is correct?

A X is an isotope of argon.

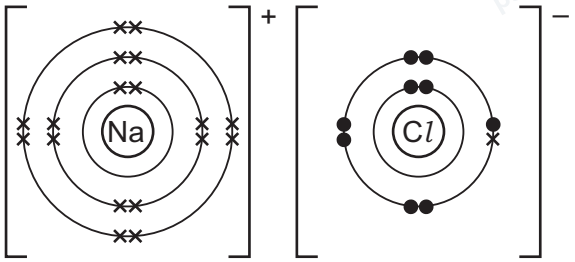
B X is an isotope of neon.

C Y is an isotope of potassium.

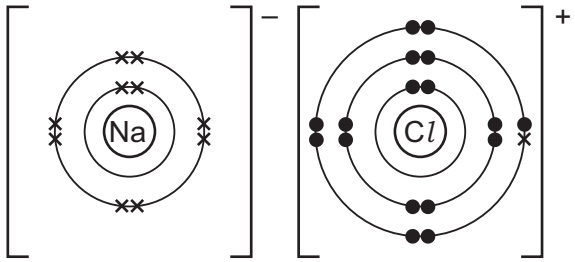
D Y is an isotope of zirconium.

6 Which dot-and-cross diagram represents the bonding in sodium chloride?

A



B



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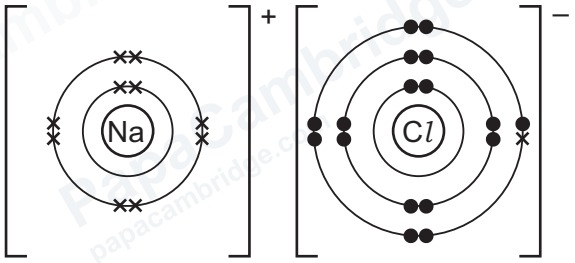

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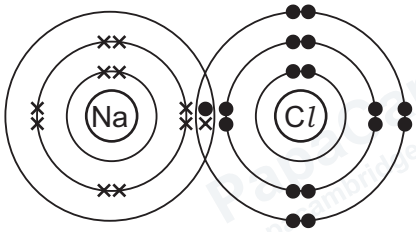

7 The formula of ammonia is NH_3.

Which statement about a molecule of ammonia is correct?

A The bonding in a molecule of ammonia is ionic.

B The nitrogen atom has a noble gas configuration; the hydrogen atoms do **not**.

C The nitrogen atom shares all of its electrons with the hydrogen atoms.

D There are six shared electrons in a molecule of ammonia.

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8 Which statement about graphite is correct?

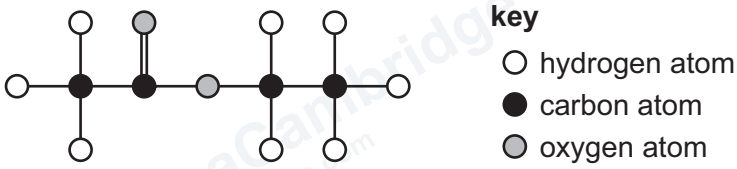
A It has a low melting point because it has a simple molecular structure.

B It has a high melting point because it has a giant ionic structure.

C It has a low melting point because it has weak forces of attraction between layers of atoms.

D It has a high melting point because it has a giant covalent structure.

9 The diagram shows a model of an organic molecule.



What is the molecular formula of this organic molecule?

A $C_2H_8O_4$ **B** C_2H_4O **C** $C_4H_6O_2$ **D** $C_4H_8O_2$

10 What is the relative formula mass of ammonium nitrate, NH_4NO_3?

A 80 **B** 108 **C** 122 **D** 150

11 Substance X is electrolysed.

A different gas is produced at each electrode. The gases are collected and tested at room temperature.

One of the gases produces a squeaky pop when tested with a lighted splint. The other gas bleaches damp litmus paper.

What is substance X?

A concentrated aqueous sodium chloride

B dilute sulfuric acid

C molten lead(II) bromide

D molten potassium chloride

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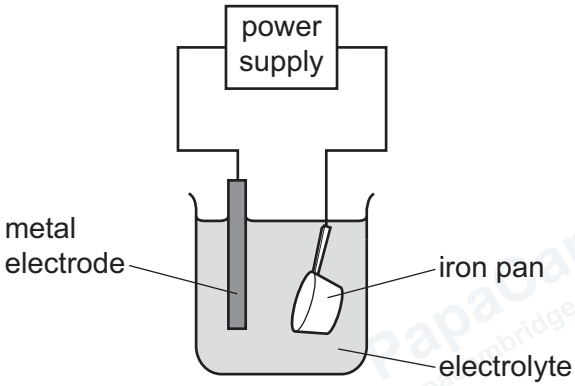
12 An iron pan is electroplated with copper.

The apparatus for the electroplating is shown.



Which row identifies the metal electrode and the electrolyte?

	metal electrode	electrolyte
A	copper anode	aqueous iron(II) nitrate
B	copper anode	aqueous copper(II) nitrate
C	copper cathode	aqueous iron(II) nitrate
D	copper cathode	aqueous copper(II) nitrate

13 Four statements about hydrogen fuel cells are listed.

1 Carbon dioxide and water are produced in the fuel cell.

2 In the fuel cell, hydrogen combines with oxygen.

3 The fuel cell converts chemical energy into electrical energy.

4 The hydrogen fuel is extracted from the air.

Which statements are correct?

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

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14 Four changes are described.

1 When sodium is added to water, thermal energy is released.

2 When water boils, thermal energy is absorbed.

3 When concentrated sulfuric acid is added to water, the temperature of the surroundings increases.

4 When ammonium nitrate is added to water, the temperature of the surroundings decreases.

Which changes are endothermic?

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

15 Which process involves a chemical change?

A adding sodium to water

B boiling water

C dissolving sodium chloride in water

D producing water from aqueous sodium chloride

16 Which word equation is correct?

A calcium + water → calcium hydroxide + hydrogen

B zinc + hydrochloric acid → zinc chloride + water

C magnesium + oxygen → magnesium oxide + water

D aluminium + sulfuric acid → aluminium nitrate + hydrogen

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17 Dilute hydrochloric acid reacts with calcium carbonate.

1.0 g of calcium carbonate is added to 50 cm^3 of dilute hydrochloric acid and the initial rate of reaction is calculated.

The experiment is repeated but **one** change is made.

All other conditions are the same.

Which row is correct?

	change made in second experiment	**initial rate of second experiment compared to first experiment**
A	100 cm^3 of dilute acid is used	increases
B	100 cm^3 of dilute acid is used	no change
C	2.0 g of calcium carbonate is used	decreases
D	2.0 g of calcium carbonate is used	no change

18 Substance X is a blue solid.

When X is heated, steam is produced and the solid turns white.

What is X?

A anhydrous cobalt(II) chloride

B anhydrous copper(II) sulfate

C hydrated cobalt(II) chloride

D hydrated copper(II) sulfate

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19 The equations show two chemical reactions involved in the production of iron from its ore.

1 $C + CO_2 \rightarrow 2CO$

2 $Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$

Which substance is reduced in reaction 1 and in reaction 2?

	reaction 1	**reaction 2**
A	CO_2	CO
B	CO_2	Fe_2O_3
C	C	CO
D	C	Fe_2O_3

20 Which solids neutralise dilute sulfuric acid to form aqueous magnesium sulfate?

1 magnesium carbonate

2 magnesium hydroxide

3 magnesium nitrate

4 magnesium oxide

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

21 Which statement about bases is correct?

A All bases dissolve in water to form solutions with a pH greater than 7.

B Bases react with ammonium salts to form ammonia gas.

C All oxides of elements in Period 3 of the Periodic Table are bases.

D Bases react with acids to form a salt and hydrogen.

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22 A method used to make copper(II) sulfate crystals is shown.

1 Place dilute sulfuric acid in a beaker.
2 Warm the acid.
3 Add copper(II) oxide until it is in excess.
4 Filter the mixture.
5 Evaporate the filtrate until crystals start to form.
6 Leave the filtrate to cool.

What are the purposes of step 3 and step 4?

	step 3	step 4
A	to ensure all of the acid has reacted	to obtain solid copper(II) sulfate
B	to ensure all of the acid has reacted	to remove the excess of copper(II) oxide
C	to speed up the reaction	to obtain solid copper(II) sulfate
D	to speed up the reaction	to remove the excess of copper(II) oxide

23 Which row describes the changes across a period of the Periodic Table, from left to right?

	number of outer-shell electrons	metallic character
A	decreases	decreases
B	decreases	increases
C	increases	increases
D	increases	decreases

24 Which statements about elements in Group VIII of the Periodic Table are correct?

1 Atoms of the elements have full outer electron shells.
2 They are diatomic.
3 They are gaseous at room temperature and pressure.
4 They react with water.

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

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25 Caesium is a Group I element.

Which statement describes a property of caesium?

A It does **not** conduct electricity.

B It has a higher melting point than sodium.

C It reacts more vigorously with water than potassium.

D It is less dense than lithium.

26 Aqueous bromine is added to aqueous sodium iodide.

bromine + sodium iodide → .....1..... + ...2.....

What are the products of this reaction?

	1	2
A	iodide	sodium bromide
B	iodide	sodium bromine
C	iodine	sodium bromide
D	iodine	sodium bromine

27 Some properties of element X are listed.

1 It forms coloured compounds.

2 It has a high melting point.

3 It has a high density.

Which properties show that X is a transition element?

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

28 Cobalt is a metal. It is more reactive than hydrogen, but less reactive than iron.

Which statements are correct?

1 Cobalt reacts with dilute hydrochloric acid.

2 Cobalt reacts rapidly with cold water to form hydrogen gas.

3 Cobalt is more reactive than zinc.

4 Cobalt is more reactive than copper.

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

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29 Which substances in the air are needed for iron to rust?

A oxygen and water

B oxygen only

C water and carbon dioxide

D water only

30 In a titration, why is distilled water and **not** tap water used to rinse the burette?

A Distilled water contains more bacteria than tap water.

B Distilled water contains fewer dissolved ions than tap water.

C Distilled water dissolves substances better than tap water.

D Distilled water has been filtered and tap water has **not**.

31 'Fastgrow' is an NPK fertiliser containing elements essential for improved plant growth.

Which mixture of substances is used to make 'Fastgrow'?

A ammonium sulfate and potassium nitrate

B ammonium nitrate and potassium phosphate

C sodium nitrate and ammonium phosphate

D sodium phosphate and potassium chloride

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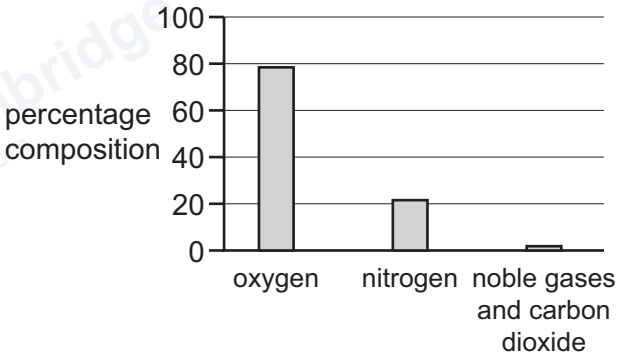
32 Which diagram shows the percentage composition of clean, dry air?

A



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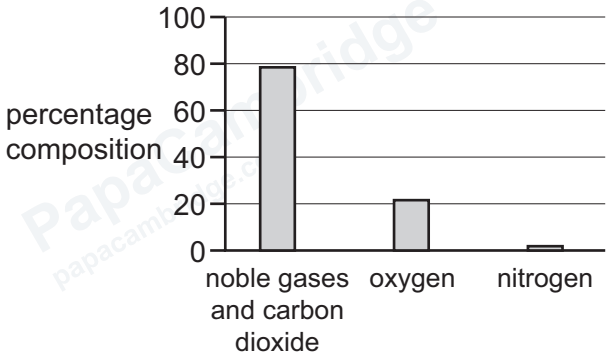

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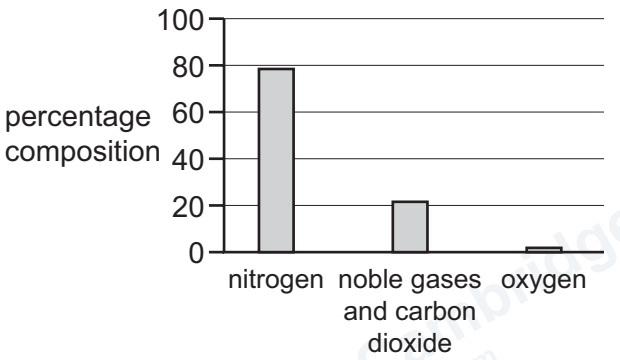

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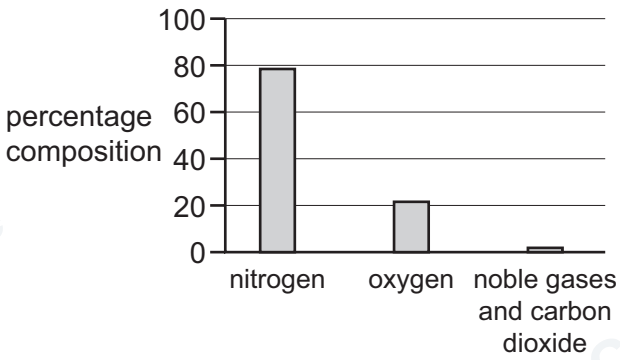


33 What is the general formula of the alcohol homologous series?

A C_nH_nOH **B** $C_nH_{2n-1}OH$ **C** $C_nH_{2n}OH$ **D** $C_nH_{2n+1}OH$

34 Which statement describes ethane?

A It is a saturated covalent compound.

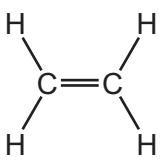
B It is an unsaturated covalent compound.

C It is a saturated ionic compound.

D It is an unsaturated ionic compound.

35 Which structure represents ethene?

A



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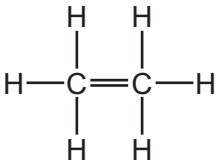

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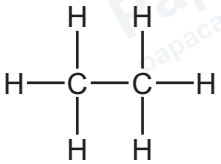

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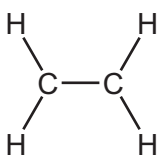

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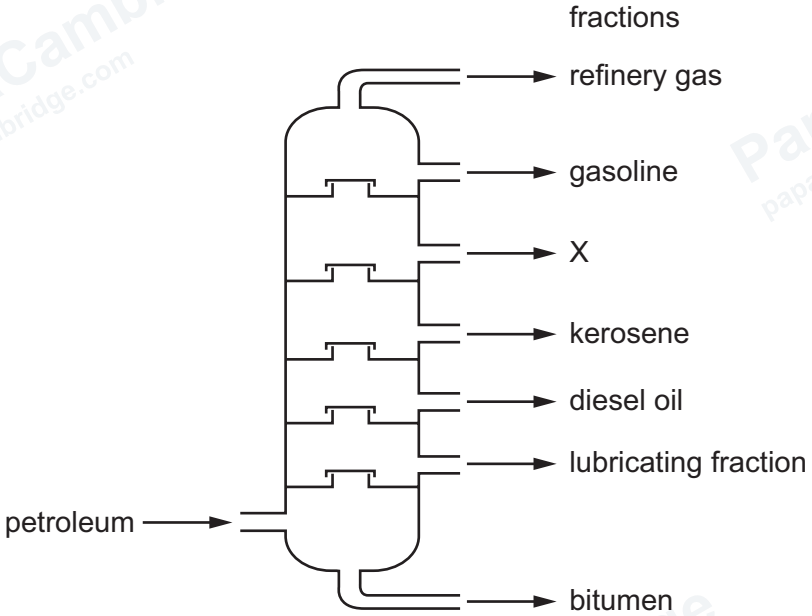
36 What is the name of fraction X?



A alcohol

B fuel oil

C naphtha

D paraffin

37 Four equations involving ethanoic acid are listed.

1 ethanoic acid + calcium → calcium ethanoate + water

2 ethanoic acid + magnesium oxide → magnesium ethanoate + water

3 $CH_3COOH + NaOH \rightarrow CH_3COONa + H_2O$

4 $2CH_3COOH + Na_2CO_3 \rightarrow 2CH_3COONa + H_2O$

Which equations are correct?

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

38 Which piece of apparatus is used to measure exactly 25.00 cm^3 of dilute hydrochloric acid?

A a balance

B a beaker

C a measuring cylinder

D a volumetric pipette

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39 A mixture contains sand and an aqueous solution of sodium chloride.

Which processes are used to obtain a sample of solid sand **and** a sample of solid sodium chloride from the mixture?

A crystallisation followed by filtration

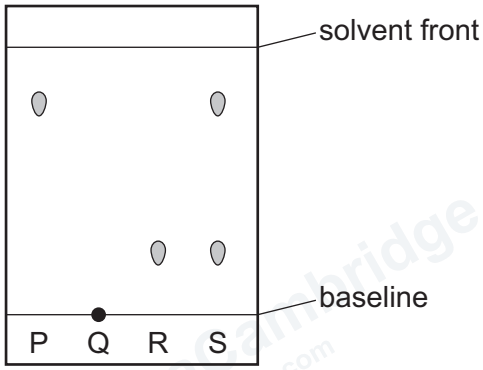
B evaporation followed by filtration

C filtration followed by crystallisation

D simple distillation followed by crystallisation

40 Four coloured substances, P, Q, R and S, are analysed by chromatography.

The chromatogram is shown.



Which statements are correct?

1 P is less soluble in the solvent than R.

2 R is a pure substance.

3 Q is insoluble in the solvent used.

4 S is a mixture of P and R.

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

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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 –	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 –

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

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