

# The City School

Unified Mid-Year Examinations

2018 - 2019

Class 10



SCHOOL NAME

INDEX NUMBER

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DATE

**CHEMISTRY**

Paper 1 Multiple Choice

**5070/12**

**1 hour**

Additional Materials: Multiple Choice Answer Sheet  
Soft Pencil  
Soft clean eraser

**READ THESE INSTRUCTIONS FIRST**

Write in soft pencil.

Do not use paper clips, glue or correction fluid.

Write your School name, Index number and Date in the spaces provided.

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 **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 Periodic Table is printed on page 16.

Electronic calculators may be used.

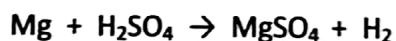
Invigilated By: \_\_\_\_\_

Checked By: \_\_\_\_\_

Marks Talled By: \_\_\_\_\_

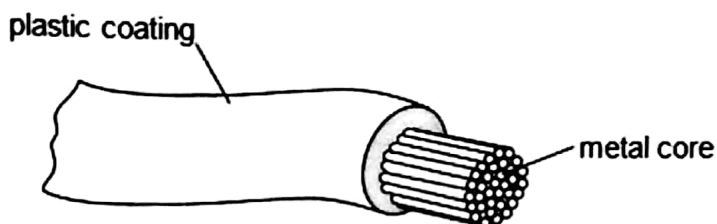
This document consists of **15** printed pages and **1** blank page.

- 1 The equation shows the reaction between magnesium and sulfuric acid. [A<sub>r</sub>: H, 1; O, 16; Mg, 24; S, 32]



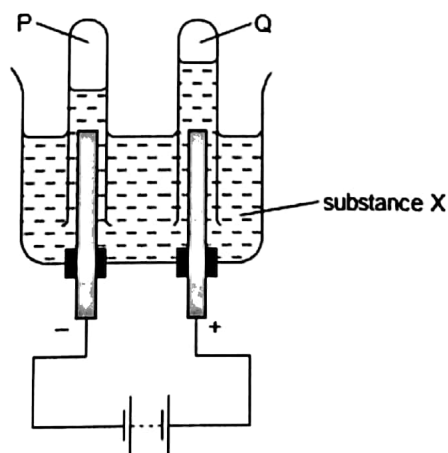
In this reaction, which mass of magnesium sulfate is formed when 6 g of magnesium react with excess sulfuric acid?

- A 8                      B 24                      C 30                      D 60
- 2 The diagram shows an electrical cable.



Which statement about the substances used is correct?

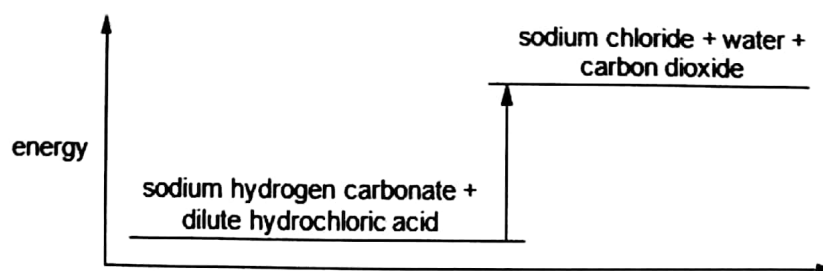
- A The coating is plastic because it conducts electricity well.  
B The core is copper because it conducts electricity well.  
C The core is copper because it is cheap and strong.  
D The core is iron because it is cheap and strong.
- 3 When substance X is electrolysed, the amount of gases P and Q formed is shown.



What is substance X?

- A concentrated aqueous sodium chloride  
B concentrated hydrochloric acid  
C dilute sulfuric acid  
D molten lead(II) bromide

- 4 The energy level diagram for the reaction between sodium hydrogen carbonate and dilute hydrochloric acid is shown.

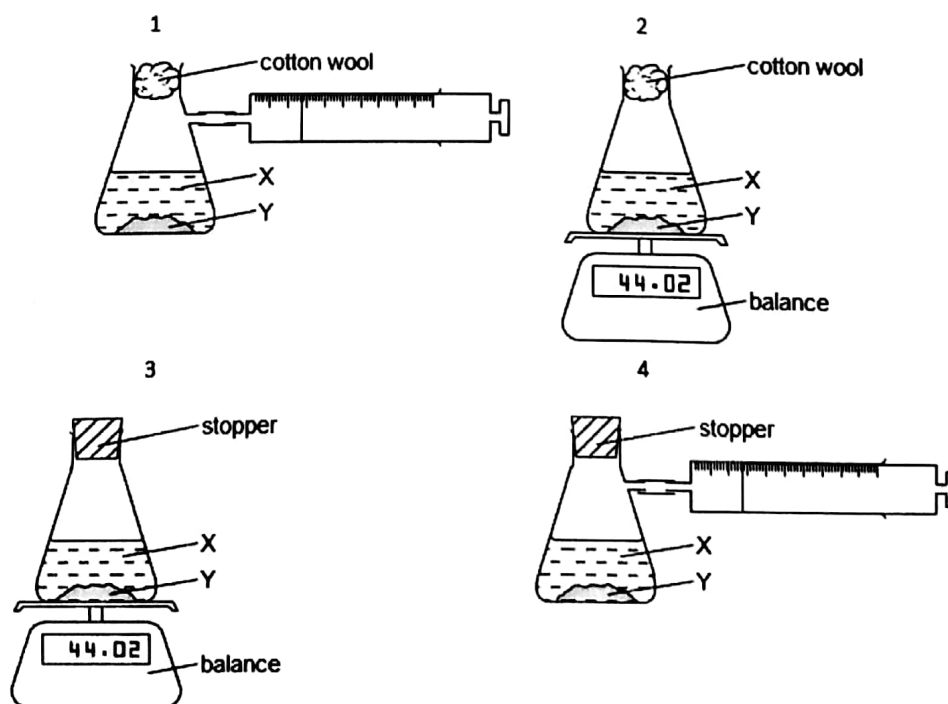


Which row correctly describes the type of reaction and the energy of the reactants and products?

	type of reaction	energy of the reactants and products
A	endothermic	the products have more energy than the reactants
B	endothermic	the reactants have more energy than the products
C	exothermic	the products have more energy than the reactants
D	exothermic	the reactants have more energy than the products

- 5 A liquid X reacts with solid Y to form a gas.

Which two diagrams show suitable methods for investigating the rate (speed) of the reaction?



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

6 The results of two tests on solid X are shown.

test	observation
aqueous sodium hydroxide added	green precipitate formed
acidified silver nitrate added	yellow precipitate formed

What is X?

- A copper(II) chloride
  - B copper(II) iodide
  - C iron(II) chloride
  - D iron(II) iodide
- 7 Students, X, Y and Z, were told that solid P reacts with dilute acids and also conducts electricity.

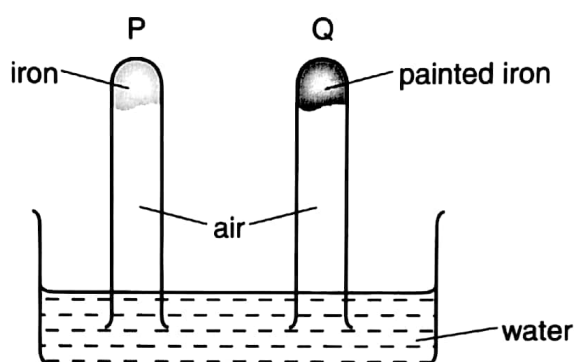
X	Y	Z
copper	iron	graphite

The table shows the students' suggestions about the identity of P.

Which of the students are correct?

- A X, Y and Z
  - B X only
  - C Y only
  - D Z only
- 8 Tin is a metal that is less reactive than iron and is extracted from its ore cassiterite,  $\text{SnO}_2$ .
- Which statements about tin are correct?
- 1 Tin can be extracted from cassiterite using carbon.
  - 2 Tin does not conduct electricity.
  - 3 Tin is hard and shiny.
- A 1, 2 and 3
  - B 1 and 2 only
  - C 1 and 3 only
  - D 2 and 3 only

- 9 Which statement about the uses of metals is correct?
- A Aluminium is used in the manufacture of aircraft because of its strength and high density.
- B Copper is used in electrical wiring because of its strength and high density.
- C Mild steel is used in the manufacture of car bodies because of its strength and resistance to corrosion.
- D Stainless steel is used in the construction of chemical plant because of its strength and resistance to corrosion.
- 10 The diagram shows an experiment to investigate how paint affects the rusting of iron.



What happens to the water level in tubes P and Q?

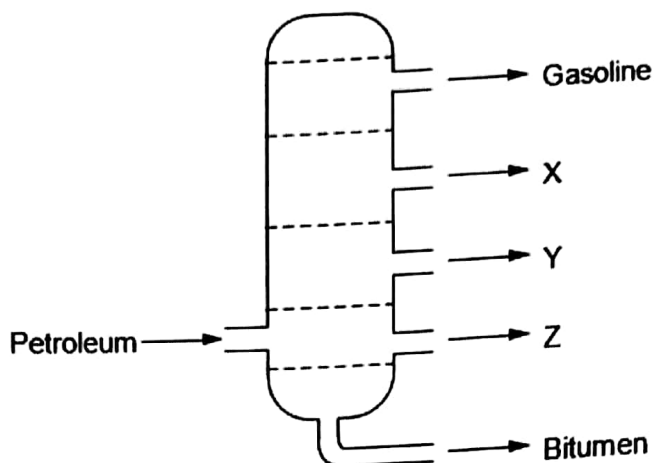
	tube P	tube Q
A	falls	rises
B	no change	rises
C	rises	falls
D	rises	no change

- 11 Water was added to separate samples of anhydrous cobalt(II) chloride and anhydrous copper(II) sulfate.

Which row describes the colour changes that take place in these reactions?

	cobalt(II) chloride	copper(II) sulfate
A	blue to pink	blue to white
B	blue to pink	white to blue
C	pink to blue	blue to white
D	pink to blue	white to blue

12 The diagram shows the separation of petroleum into fractions.



What could X, Y and Z represent?

	X	Y	Z
<b>A</b>	diesel oil	lubricating fraction	paraffin
<b>B</b>	lubricating fraction	diesel oil	paraffin
<b>C</b>	paraffin	lubricating fraction	diesel oil
<b>D</b>	paraffin	diesel oil	lubricating fraction

13 What is the relative formula mass of ammonium nitrate,  $\text{NH}_4\text{NO}_3$ ?

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

14 Concentrated aqueous sodium chloride is electrolysed.

What is the main product formed at the positive electrode (anode)?

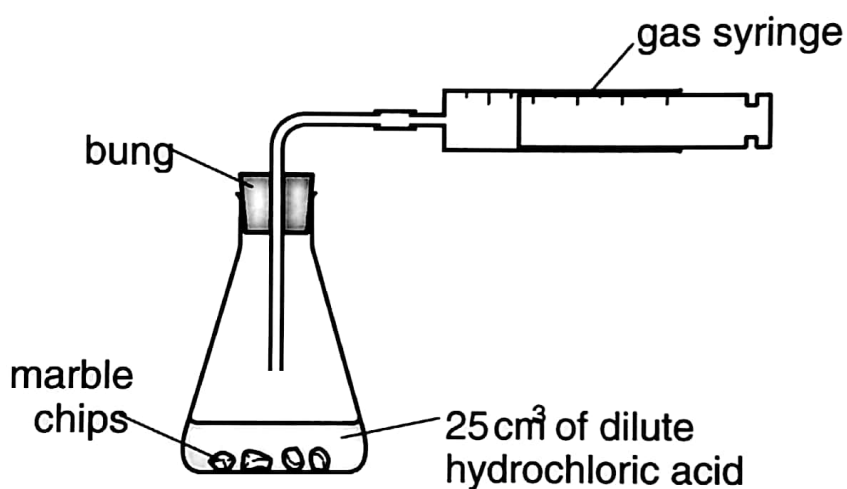
- A** chlorine  
**B** hydrogen  
**C** oxygen  
**D** sodium

15 Some properties of four fuels are shown in the table.

Which fuel is a gas at room temperature and makes two products when it burns in a plentiful supply of air?

	fuel	formula	melting point / °C	boiling point / °C
A	hydrogen	H <sub>2</sub>	-259	-253
B	methane	CH <sub>4</sub>	-182	-164
C	octane	C <sub>8</sub> H <sub>18</sub>	-57	126
D	wax	C <sub>31</sub> H <sub>64</sub>	60	400

16 A student was investigating the reaction between marble chips and dilute hydrochloric acid.



Which changes slow down the rate of reaction?

	temperature of acid	concentration of acid	surface area of marble chips
A	decrease	decrease	decrease
B	decrease	decrease	increase
C	increase	decrease	decrease
D	increase	increase	increase

17 Which statement about the extraction of iron in a blast furnace is **not** correct?

- A Calcium oxide reacts with acidic impurities.
- B Iron(III) oxide is reduced to iron by carbon dioxide.
- C Molten iron is formed at the base of the blast furnace.
- D The raw materials are hematite, limestone and coke.

18 Stainless steel is an alloy of iron and other metals. It is strong and does not rust but it costs much more than normal steel.

What is **not** made from stainless steel?

- A cutlery
- B pipes in a chemical factory
- C railway lines
- D saucepans

19 Which fraction of petroleum is **not** matched to its correct use?

	fraction	use
A	bitumen	making roads
B	gasoline	fuel for cars
C	kerosene	fuel for ships
D	naphtha	chemical industry

20 The equation shows the thermal decomposition of magnesium carbonate ( $M_r = 84$ ).

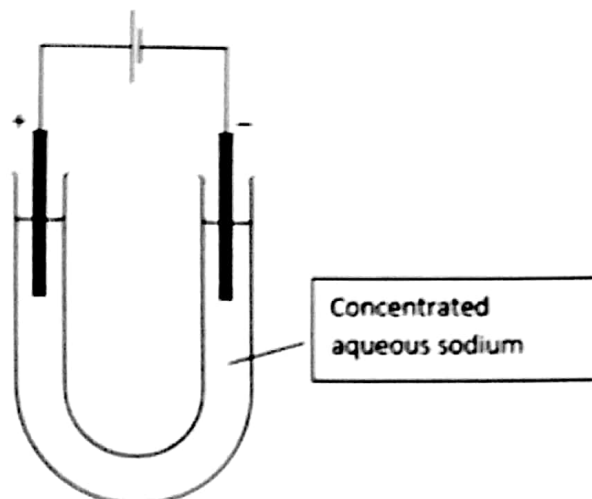


Which mass of magnesium oxide is formed when 21.0 g of magnesium carbonate are completely decomposed?

- A 1.9 g                      B 4.0 g                      C 10.0 g                      D 40.0 g



- 21 Electricity is passed through concentrated aqueous sodium chloride. Inert electrodes are used.



What is formed at the negative electrode?

- A chlorine
- B hydrogen
- C oxygen
- D sodium

- 22 Two chemical processes are described.

During the combustion of gasoline, energy is .....1..... .

During the electrolysis of sulfuric acid, energy is .....2..... .

Which words complete gaps 1 and 2?

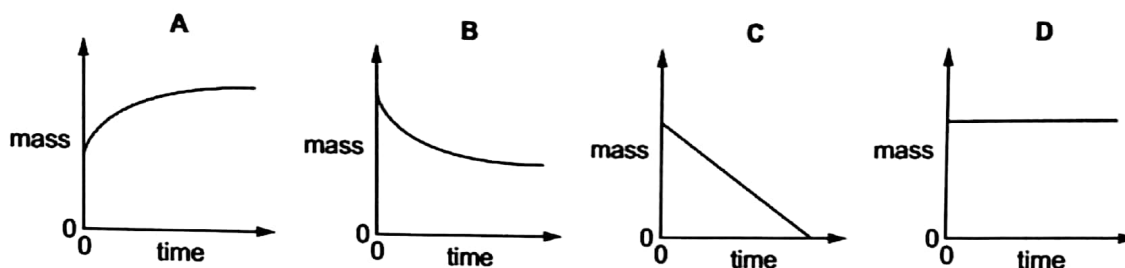
	1	2
A	given out	given out
B	given out	taken in
C	taken in	given out
D	taken in	taken in

**23** When dilute sulfuric acid reacts with aqueous sodium hydroxide, the temperature of the solution increases. Which words describe this reaction?

- A endothermic and neutralisation
- B endothermic and redox
- C exothermic and neutralisation
- D exothermic and redox

**24** The mass of a beaker and its contents is plotted against time.

Which graph represents what happens when sodium carbonate reacts with an excess of dilute hydrochloric acid in an open beaker?



**25** When blue copper(II) sulfate is heated, a white solid and water are formed. The white solid turns blue and gives out heat when water is added to it. Which terms describe the blue copper(II) sulfate and the reactions?

	the blue copper(II) sulfate is	reactions
<b>A</b>	a mixture	can be reversed
<b>B</b>	a mixture	cannot be reversed
<b>C</b>	hydrated	can be reversed
<b>D</b>	hydrated	cannot be reversed

**26** Which changes increase the rate of reaction between calcium carbonate and dilute hydrochloric acid?

- 1 increasing the concentration of the acid
- 2 increasing the temperature
- 3 increasing the size of the pieces of calcium carbonate

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

27 What is used to test for chlorine?

- A a glowing splint
- B damp litmus paper
- C limewater
- D potassium manganate(VII) solution

28 What is a property of all metals?

- A conduct electricity
- B hard
- C low melting points
- D react with water

29 Which material is **not** involved in the large-scale extraction of iron from iron ore?

- A bauxite
- B calcium carbonate (limestone)
- C carbon (coke)
- D hematite

30 Which uses of the metals shown are both correct?

	aluminium	stainless steel
A	aircraft bodies	cutlery
B	car bodies	aircraft bodies
C	chemical plant	food containers
D	food containers	car bodies

**31** Iron is a metal that rusts in the presence of oxygen and water.

Mild steel is used for .....1..... and is prevented from rusting by .....2..... .

Stainless steel does not rust. It is produced by .....3..... iron with another metal.

Which words complete gaps 1, 2 and 3?

	1	2	3
<b>A</b>	car bodies	greasing	covering
<b>B</b>	car bodies	painting	mixing
<b>C</b>	cutlery	greasing	covering
<b>D</b>	cutlery	painting	mixing

**32** Some marble chips (calcium carbonate) are heated strongly and substances X and Y are formed.

Substance X is a white solid that reacts with water, giving out heat. Substance Y is a colourless gas.

What are substances X and Y?

	X	Y
<b>A</b>	calcium chloride	oxygen
<b>B</b>	calcium hydroxide	carbon dioxide
<b>C</b>	calcium oxide	carbon dioxide
<b>D</b>	calcium sulfate	oxygen

**33** Some of the fractions obtained from the fractional distillation of petroleum are used as fuels for vehicles.

Which two fractions are used as fuels for vehicles?

- A** bitumen fraction and gasoline fraction
- B** bitumen fraction and naphtha fraction
- C** gasoline fraction and kerosene fraction
- D** kerosene fraction and lubricating fraction

34 Burning fossil fuels releases heat energy.

Which substance is **not** a fossil fuel?

- A coal
- B hydrogen
- C natural gas
- D petroleum

35 The results of two tests on solution X are shown.

reagent added	observation on adding a few drops of reagent	observation on adding an excess of reagent
aqueous sodium hydroxide	white precipitate	precipitate dissolves
aqueous ammonia	white precipitate	precipitate remains

Which ion is present in solution X?

- A  $Al^{3+}$
- B  $Ca^{2+}$
- C  $Cu^{2+}$
- D  $Zn^{2+}$

36 The relative atomic mass of chlorine is 35.5.

What is the mass of 2 moles of chlorine gas?

- A 17.75 g
- B 35.5 g
- C 71 g
- D 142 g

37 The empirical formula of a liquid compound is  $C_2H_4O$ .

To find the empirical formula, it is necessary to know

- A the density of the compound.
- B the percentage composition by mass of the compound.
- C the relative molecular mass of the compound.
- D the volume occupied by 1 mole of the compound.

38 Aluminium is produced by the electrolysis of molten aluminium oxide.

What is the correct equation for the reaction at the positive electrode?

- A  $Al \rightarrow Al^{3+} + 3e^-$
- B  $Al^{3+} + 3e^- \rightarrow Al$
- C  $O_2 + 4e^- \rightarrow 2O^{2-}$
- D  $2O^{2-} \rightarrow O_2 + 4e^-$

39 When aqueous copper(II) sulfate is electrolysed using copper electrodes, which observations are correct?

	positive electrode	negative electrode	intensity of blue colour of electrolyte
A	electrode becomes smaller	electrode becomes bigger	constant
B	electrode becomes smaller	gas given off	fades
C	gas given off	electrode becomes bigger	fades
D	gas given off	gas given off	constant

40 Which metal is attached to underground pipes made of iron, to provide sacrificial protection from corrosion?

A Ag

B Cu

C Mg

D Pb

### The Periodic Table of Elements

		Group																				
I	II	III	IV	V	VI	VII	VIII															
3 <b>Li</b> lithium 7	4 <b>Be</b> beryllium 9	1 <b>H</b> hydrogen 1	5 <b>B</b> boron 11	6 <b>C</b> carbon 12	7 <b>N</b> nitrogen 14	8 <b>O</b> oxygen 16	9 <b>F</b> fluorine 19	10 <b>Ne</b> neon 20														
11 <b>Na</b> sodium 23	12 <b>Mg</b> magnesium 24		13 <b>Al</b> aluminum 27	14 <b>Si</b> silicon 28	15 <b>P</b> phosphorus 31	16 <b>S</b> sulfur 32	17 <b>Cl</b> chlorine 35.5	18 <b>Ar</b> argon 40														
19 <b>K</b> potassium 39	20 <b>Ca</b> calcium 40		21 <b>Sc</b> scandium 45	22 <b>Ti</b> titanium 48	23 <b>V</b> vanadium 51	24 <b>Cr</b> chromium 52	25 <b>Mn</b> manganese 55	26 <b>Fe</b> iron 56	27 <b>Co</b> cobalt 59	28 <b>Ni</b> nickel 59	29 <b>Cu</b> copper 64	30 <b>Zn</b> zinc 65	31 <b>Ga</b> gallium 70	32 <b>Ge</b> germanium 73	33 <b>As</b> arsenic 75	34 <b>Se</b> selenium 79	35 <b>Br</b> bromine 80	36 <b>Kr</b> krypton 84				
37 <b>Rb</b> rubidium 85	38 <b>Sr</b> strontium 88		39 <b>Y</b> yttrium 89	40 <b>Zr</b> zirconium 91	41 <b>Nb</b> niobium 93	42 <b>Mo</b> molybdenum 96	43 <b>Tc</b> technetium -	44 <b>Ru</b> ruthenium 101	45 <b>Rh</b> rhodium 103	46 <b>Pd</b> palladium 106	47 <b>Ag</b> silver 108	48 <b>Cd</b> cadmium 112	49 <b>In</b> indium 115	50 <b>Sn</b> tin 119	51 <b>Sb</b> antimony 122	52 <b>Te</b> tellurium 128	53 <b>I</b> iodine 127	54 <b>Xe</b> xenon 131				
55 <b>Cs</b> caesium 133	56 <b>Ba</b> barium 137		57-71 lanthanoids	72 <b>Hf</b> hafnium 178	73 <b>Ta</b> tantalum 181	74 <b>W</b> tungsten 184	75 <b>Re</b> rhenium 186	76 <b>Os</b> osmium 190	77 <b>Ir</b> iridium 192	78 <b>Pt</b> platinum 195	79 <b>Au</b> gold 197	80 <b>Hg</b> mercury 201	81 <b>Tl</b> thallium 204	82 <b>Pb</b> lead 207	83 <b>Bi</b> bismuth 209	84 <b>Po</b> polonium -	85 <b>At</b> astatine -	86 <b>Rn</b> radon -				
87 <b>Fr</b> francium -	88 <b>Ra</b> radium -		89-103 actinoids	104 <b>Rf</b> rutherfordium -	105 <b>Db</b> dubnium -	106 <b>Sg</b> seaborgium -	107 <b>Bh</b> bohrium -	108 <b>Hs</b> hassium -	109 <b>Mt</b> meitnerium -	110 <b>Ds</b> darmstadtium -	111 <b>Rg</b> roentgenium -	112 <b>Cn</b> copernicium -	114 <b>Fl</b> flerovium -	116 <b>Lv</b> livermorium -								

**Key**

atomic number

atomic symbol

name

relative atomic mass

<b>lanthanoids</b>		57 <b>La</b> lanthanum 139	58 <b>Ce</b> cerium 140	59 <b>Pr</b> praseodymium 141	60 <b>Nd</b> neodymium 144	61 <b>Pm</b> promethium -	62 <b>Sm</b> samarium 150	63 <b>Eu</b> europium 152	64 <b>Gd</b> gadolinium 157	65 <b>Tb</b> terbium 159	66 <b>Dy</b> dysprosium 163	67 <b>Ho</b> holmium 165	68 <b>Er</b> erbium 167	69 <b>Tm</b> thulium 169	70 <b>Yb</b> ytterbium 173	71 <b>Lu</b> lutetium 175
<b>actinoids</b>		89 <b>Ac</b> actinium -	90 <b>Th</b> thorium 232	91 <b>Pa</b> protactinium 231	92 <b>U</b> uranium 238	93 <b>Np</b> neptunium -	94 <b>Pu</b> plutonium -	95 <b>Am</b> americium -	96 <b>Cm</b> curium -	97 <b>Bk</b> berkelium -	98 <b>Cf</b> californium -	99 <b>Es</b> einsteinium -	100 <b>Fm</b> fermium -	101 <b>Md</b> mendelevium -	102 <b>No</b> nobelium -	103 <b>Lr</b> lawrencium -

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