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CHEMISTRY **0620/12**

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

45 minutes

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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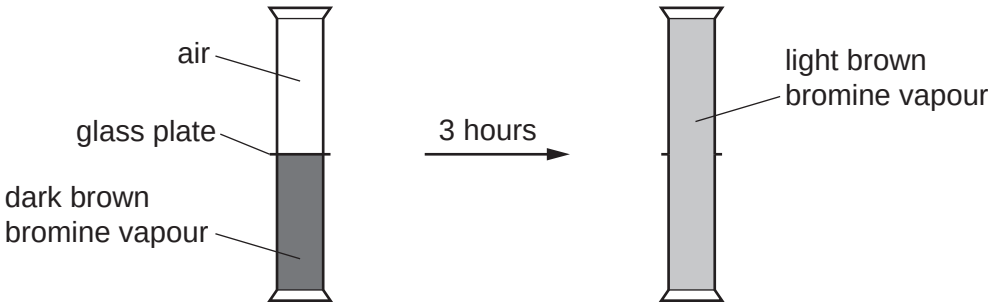
[Turn over

1 Two gas jars are arranged as shown.

View solution

The glass plate is removed and the jars allowed to stand for 3 hours.



Which statement explains the change in the gas jars after 3 hours?

A Bromine has a greater density than air.

B Bromine particles move from an area of high concentration to an area of low concentration.

C Bromine particles move faster than the particles in air.

D The particles in air are heavier than those in bromine.

2 What is the relative charge and the relative mass of an electron?

View solution

	relative charge	**relative mass**
A	–1	$\frac{1}{1840}$
B	0	1
C	+1	$\frac{1}{1840}$
D	–1	1

3 Which row identifies the particles present in the nucleus and in the shells of one atom of $^{7}_{3}Li$?

View solution

	particles present in the nucleus of one atom of $^{7}_{3}Li$	**particles present in the shells of one atom of $^{7}_{3}Li$**
A	3 protons and 4 neutrons	3 electrons
B	4 protons and 3 neutrons	4 electrons
C	3 electrons and 4 neutrons	3 protons
D	4 electrons and 3 neutrons	4 protons

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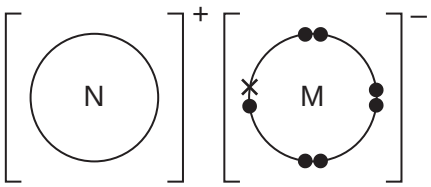
4 Element M is in Group I and element N is in Group VII.

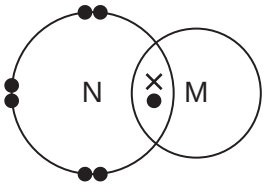
Which diagram represents the bond that forms when element M and element N react together?

View solution

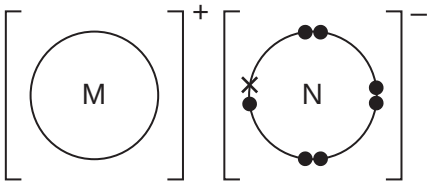
A



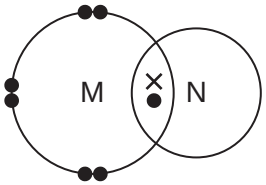
B



C



D



5 What is the total number of shared electrons in one molecule of ammonia?

View solution

A 2 **B** 4 **C** 6 **D** 8

6 Which use of graphite depends on the layers of carbon atoms being able to slide over each other?

View solution

A cutting tools

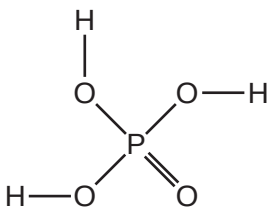
B electrodes

C jewellery

D lubricant

7 The diagram represents phosphoric acid.

View solution



What is the molecular formula for phosphoric acid?

A H_2PO_4 **B** HPO_4 **C** H_3PO_4 **D** $P(OH)_4$

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8 The equation for the complete combustion of methane, CH_4, is shown.

View solution

$$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$$

160 g of methane is completely combusted in oxygen to form carbon dioxide and water only.

[M_r: CH_4, 16; O_2, 32; H_2O, 18]

Which row gives the mass of oxygen needed for complete combustion and the mass of water formed?

	mass of oxygen needed for complete combustion / g	**mass of water formed / g**
A	320	180
B	320	360
C	640	180
D	640	360

9 Four units are listed.

View solution

1 dm^3 / mol

2 g / dm^3

3 mol / dm^3

4 g / mol

Which units are units of concentration?

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

10 Which row identifies the cathode, the anode and the electrolyte when nickel is electroplated with a thin layer of silver?

View solution

	cathode	**anode**	**electrolyte**
A	silver	nickel	aqueous silver nitrate
B	nickel	silver	aqueous silver nitrate
C	silver	nickel	aqueous nickel(II) nitrate
D	nickel	silver	aqueous nickel(II) nitrate

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11 X is an insoluble binary compound.

View solution

In an experiment, X is electrolysed to form two elements.

Which statement describes X?

A X is a molten ionic compound.

B X is an aqueous ionic compound.

C X is a molten covalent compound.

D X is a solid covalent compound.

12 Which statement about a fuel cell in a car is correct?

View solution

A The fuel cell produces heat, which powers the car.

B The fuel cell is supplied with hydrogen directly from the air.

C The only emission from a fuel cell is nitrogen gas, which is non-polluting.

D The fuel cell produces electricity, which powers an electric motor.

13 Which statement describes an exothermic reaction?

View solution

A Thermal energy is transferred to the surroundings leading to a decrease in the temperature of the surroundings.

B Thermal energy is transferred to the surroundings leading to an increase in the temperature of the surroundings.

C Thermal energy is taken in from the surroundings leading to an increase in the temperature of the surroundings.

D Thermal energy is taken in from the surroundings leading to a decrease in the temperature of the surroundings.

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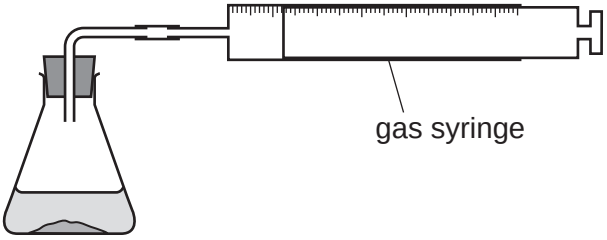
14 An experiment X is carried out between a solid and a solution using the apparatus shown.

View solution

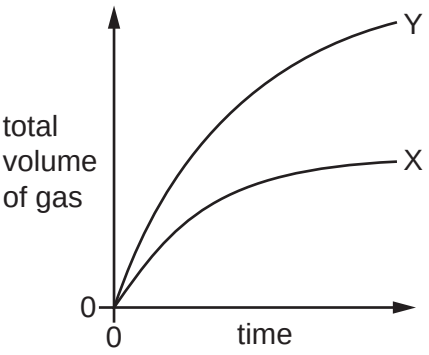


The total volume of gas given off is measured at different times and the results plotted on a graph.

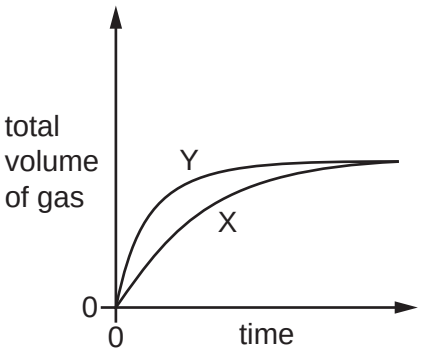
In a second experiment Y, the surface area of the solid is increased but all other factors remain the same.

Which graph shows the results of experiments X and Y?

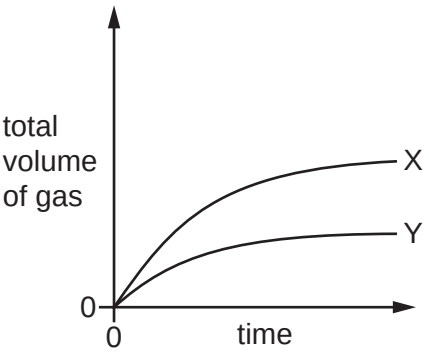
A



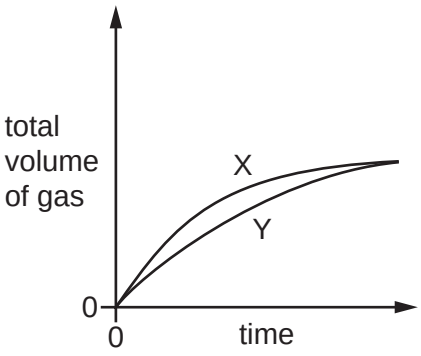
B



C



D



15 What is shown by the symbol ⇌ in the equation for a chemical reaction?

View solution

A Heat is needed for the reaction to occur.

B Water is needed for the reaction to occur.

C A catalyst is needed to increase the rate of reaction.

D The chemical reaction is reversible.

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16 Farmers add calcium oxide (lime) and ammonium salts to their fields.

View solution

The compounds are **not** added at the same time because they react with each other.

Which gas is produced in this reaction?

A ammonia

B carbon dioxide

C hydrogen

D nitrogen

17 Which row identifies the universal indicator colour, pH and hydrogen ion concentration for the stated solution?

View solution

	description	universal indicator colour	pH	hydrogen ion concentration
A	strong alkali	blue	8	high
B	weak acid	blue	6	low
C	strong acid	red	1	high
D	weak alkali	yellow	5	low

18 Magnesium sulfate is a soluble solid which is formed when insoluble magnesium oxide reacts with dilute sulfuric acid.

View solution

Which method is used to prepare solid magnesium sulfate?

A Excess sulfuric acid is reacted with magnesium oxide. The mixture is evaporated to dryness.

B Excess sulfuric acid is reacted with magnesium oxide. The precipitate is filtered, washed and dried.

C Sulfuric acid is reacted with excess magnesium oxide. The mixture is filtered and the filtrate is evaporated to dryness.

D Sulfuric acid is reacted with excess magnesium oxide. The precipitate is filtered, washed and dried.

19 What is the charge on one ion of strontium, Sr?

View solution

A 1+ **B** 2+ **C** 1– **D** 2–

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20 Elements P, Q and R are three elements in Group I of the Periodic Table.

View solution

Element P has a lower density than element Q.

Element Q has a higher melting point than element R.

What are elements P, Q and R?

	element P	element Q	element R
A	lithium	sodium	potassium
B	sodium	potassium	lithium
C	lithium	potassium	sodium
D	potassium	lithium	sodium

21 Fluorine is the element above chlorine in Group VII of the Periodic Table.

View solution

Which statements about fluorine are correct?

1 Fluorine is a solid at room temperature and pressure.

2 Iodine displaces fluorine from aqueous potassium fluoride.

3 The formula of a fluorine molecule is F_2.

4 The density of fluorine is lower than the density of chlorine.

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

22 Cobalt is a transition element.

View solution

What is a property of cobalt?

A It forms coloured compounds.

B It is a poor electrical conductor.

C It has a low density.

D It has a low melting point.

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23 Which row identifies the properties that make aluminium useful as a food container?

View solution

key

✓ = yes

✗ = no

	low density	good electrical conductivity	high resistance to corrosion
A	✓	✓	✗
B	✓	✓	✓
C	✗	✓	✗
D	✗	✗	✓

24 Which alkali and acid react to produce a salt in which both the cation and anion are used to make a fertiliser?

View solution

A ammonia and hydrochloric acid

B ammonia and nitric acid

C sodium hydroxide and hydrochloric acid

D sodium hydroxide and nitric acid

25 Which row identifies properties of zinc?

View solution

	reacts with dilute acid	thermal conductivity
A	no	poor
B	no	good
C	yes	poor
D	yes	good

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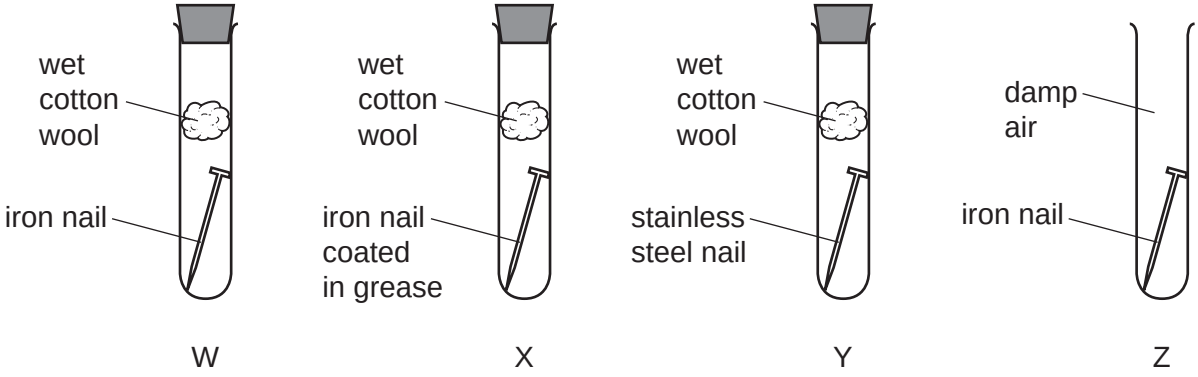
26 A scientist investigates the rusting of nails using the apparatus shown.

View solution



The nails were left for 14 days.

Which statement is correct?

A More rusting is shown in W than in X.

B More rusting is shown in X than in Z.

C More rusting is shown in Y than in Z.

D More rusting is shown in Y than in W.

27 Which row identifies the ore of aluminium and describes its extraction method?

View solution

	ore	extraction method
A	bauxite	reduction with carbon
B	bauxite	electrolysis
C	hematite	reduction with carbon
D	hematite	electrolysis

28 Water from natural sources may contain substances such as metal compounds, dissolved oxygen, phosphates and plastics.

View solution

Which statement is correct?

A Some metal compounds provide essential minerals for life.

B Dissolved oxygen is always harmful to aquatic life.

C Phosphates increase the oxygenation of the water.

D Most plastics break down into harmless substances in water.

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29 Which row identifies the source and the adverse effect of the named pollutant?

View solution

	pollutant	source	adverse effect
A	CO	complete combustion in a car engine	acid rain
B	CH_4	decomposition of vegetation	increased global warming
C	NO_2	decomposition of vegetation	photochemical smog
D	SO_2	combustion of fuels containing sulfur	increased global warming

30 The percentage composition of gases on the planet Neptune is shown.

View solution

gas	percentage composition / %
hydrogen	80
helium	18
methane	1.5
other gases	0.5

Which statement about the atmospheres on Neptune and on the Earth is correct?

A There is more helium on Neptune than oxygen on the Earth.

B There is less methane on Neptune than carbon dioxide on the Earth.

C There is less hydrogen on the Earth than on Neptune.

D There is more helium on the Earth than on Neptune.

31 Ethane, ethene, ethanol and ethanoic acid are all organic compounds.

View solution

Which compounds are hydrocarbons?

A ethane, ethene, ethanol and ethanoic acid

B ethane and ethanol only

C ethane and ethene only

D ethane only

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32 Gas oil and naphtha are two fractions obtained from petroleum.

View solution

What are uses of these fractions?

	gas oil	naphtha
A	jet fuel	making chemicals
B	jet fuel	making roads
C	diesel engine fuel	making chemicals
D	diesel engine fuel	making roads

33 Four different fuels are listed.

View solution

1 ethanol
2 petroleum
3 hydrogen
4 natural gas

Which fuels are fossil fuels?

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

34 Which formula represents a compound which turns aqueous bromine colourless?

View solution

A C_4H_{10} **B** C_4H_9OH **C** C_4H_9COOH **D** C_4H_8

35 Which statements about ethanol are correct?

View solution

1 Ethanol is made by reacting steam with ethene at 300 °C.
2 Ethanol is made by fermentation at 55 °C.
3 Ethanol burns to produce carbon dioxide and water.
4 Ethanol contains a carbon–carbon double bond.

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

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36 Potassium ethanoate is made by reacting ethanoic acid with potassium hydroxide.

View solution

What else is formed in the reaction?

key

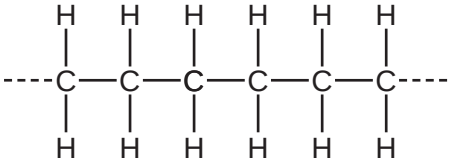
✓ = yes

✗ = no

	hydrogen	water	carbon dioxide
A	✓	✗	✓
B	✗	✓	✓
C	✓	✗	✗
D	✗	✓	✗

37 The diagram shows the structure of an important product.

View solution



This product is formed by □ ...1.□ .. of an .□ ..2□ □ .

Which words complete gaps 1 and 2?

	1	2
A	addition polymerisation	alkane
B	addition polymerisation	alkene
C	cracking	alkane
D	cracking	alkene

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38 Which processes are required to separate sand from a mixture of solid sodium chloride and sand?

View solution

1 add a suitable solvent

2 filter

3 distil

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

39 Which statement about chlorine gas is correct?

View solution

A It bleaches damp blue litmus paper.

B It turns damp red litmus paper blue.

C It decolourises acidified aqueous potassium manganate(VII).

D It turns limewater cloudy.

40 A solution of compound Z gives a light blue precipitate with aqueous ammonia. The precipitate dissolves in an excess of ammonia.

View solution

A flame test is done on compound Z.

What is the colour of the flame?

A blue-green

B lilac

C red

D yellow

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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.).