



Cambridge IGCSE™

CHEMISTRY

0620/11

Paper 1 Multiple Choice (Core)

October/November 2024

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.
- 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.

1 The table shows the melting and boiling points of four elements.

Which element is a gas at room temperature and pressure?

	melting point/°C	boiling point/°C
A	–101	–35
B	–7	59
C	10	100
D	113	445

2 Four statements about the arrangement or movement of particles are given.

- 1 Particles are packed in a regular arrangement.
- 2 Particles are randomly arranged.
- 3 Particles move over each other.
- 4 Particles vibrate about fixed points.

Which statements describe the particles in a pure solid?

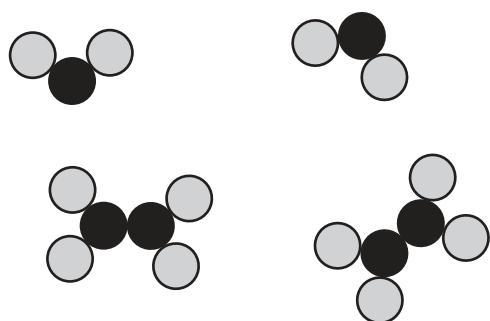
A 1 and 3 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

3 One atom of an element contains 12 electrons, 12 protons and 13 neutrons.

How many nucleons does this atom contain?

A 12 **B** 13 **C** 24 **D** 25

4 A diagram representing a mixture of four particles is shown.



Which statement describes the mixture of particles?

A It is a mixture of two different compounds.

B It is a mixture of two different elements.

C It is a mixture of four different compounds.

D It is a mixture of four different elements.

5 Chlorine reacts with sodium to form sodium chloride.

What happens to the sodium atoms during this reaction?

- A They gain electrons to form anions.
- B They lose electrons to form anions.
- C They gain electrons to form cations.
- D They lose electrons to form cations.

6 Nitrogen monoxide, NO, is a simple molecular compound.

Which row shows the properties of nitrogen monoxide?

	boiling point	electrical conductivity
A	high	good
B	high	poor
C	low	good
D	low	poor

7 Metal X is in Group II of the Periodic Table.

X is reacted separately with dilute sulfuric acid and with oxygen.

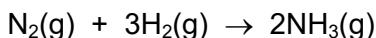
Which row identifies the products of each reaction?

	products with dilute sulfuric acid	product with oxygen
A	XSO_4 and H_2	XO
B	XSO_4 and H_2	XO_2
C	X_2SO_4 and H_2	XO
D	X_2SO_4 and H_2	XO_2

8 What is the relative molecular mass, M_r , of sulfuric acid, H_2SO_4 ?

- A 81
- B 82
- C 97
- D 98

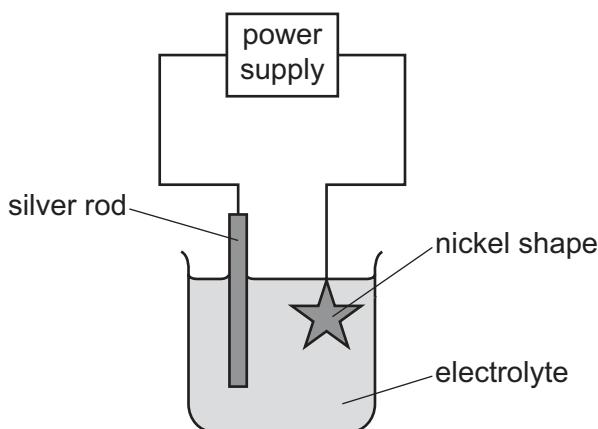
9 The equation for the production of ammonia, NH_3 , is shown.



Which mass of nitrogen is required to make 51 tonnes of ammonia?

A 21 tonnes B 25.5 tonnes C 42 tonnes D 84 tonnes

10 The diagram shows the apparatus used to electroplate a nickel shape with silver.



Which row identifies the negative electrode, the positive electrode and the electrolyte?

	negative electrode	positive electrode	electrolyte
A	silver rod	nickel shape	aqueous nickel nitrate
B	nickel shape	silver rod	aqueous silver nitrate
C	nickel shape	silver rod	aqueous nickel nitrate
D	silver rod	nickel shape	aqueous silver nitrate

11 Concentrated aqueous sodium chloride and dilute sulfuric acid are each electrolysed separately using inert electrodes.

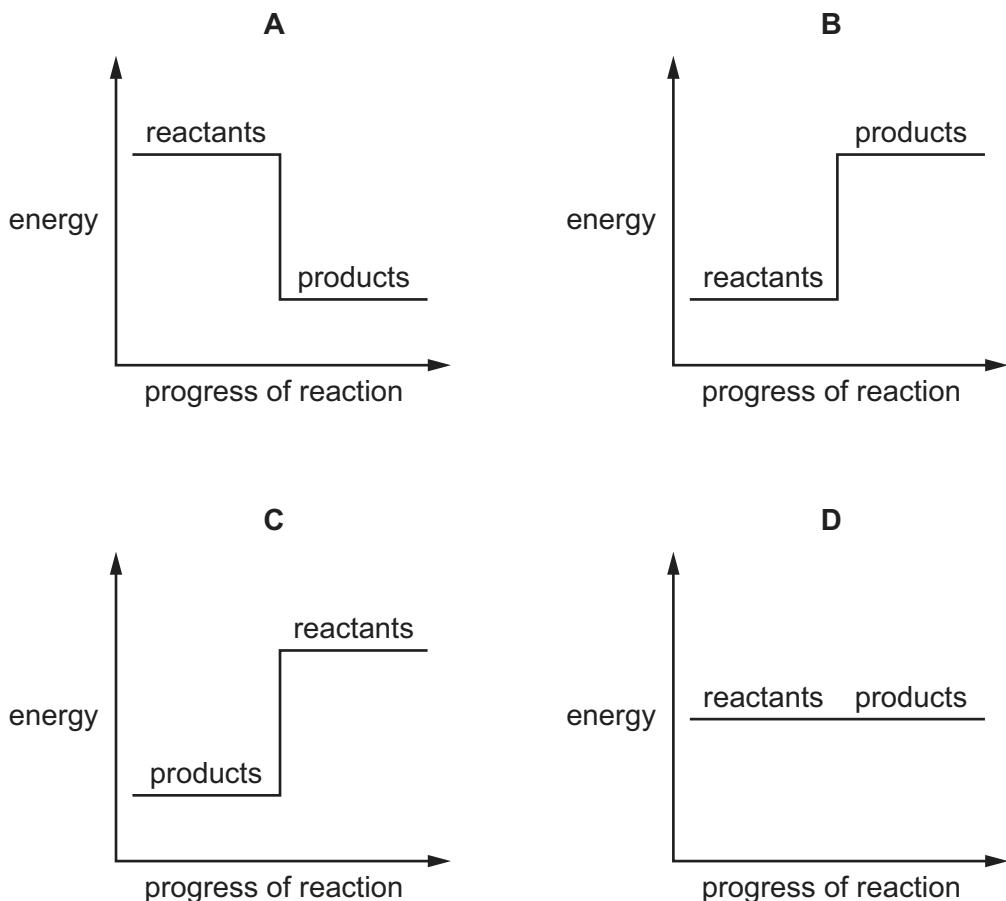
Three statements about the electrolysis of these electrolytes are listed.

- 1 A gas is produced at each electrode for both electrolytes.
- 2 Oxygen is produced at the cathode for both electrolytes.
- 3 Hydrogen is produced at the cathode for both electrolytes.

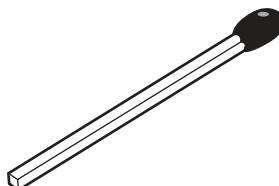
Which statements are correct?

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

12 Which reaction pathway diagram represents an endothermic reaction?



13 The diagram shows a match.

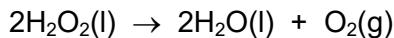


By striking the match, a chemical reaction takes place.

Which row describes the chemical reaction?

	type of reaction	reason
A	endothermic	because energy is given out as the match burns
B	endothermic	because energy is used to strike the match
C	exothermic	because energy is given out as the match burns
D	exothermic	because energy is used to strike the match

14 Hydrogen peroxide decomposes to form water and oxygen. The equation is shown.



Manganese(IV) oxide catalyses this reaction.

Which statements about manganese(IV) oxide are correct?

- 1 It increases the rate of the reaction.
- 2 It increases the total volume of oxygen gas produced at the end of the reaction.
- 3 It will have the same mass at the end of the reaction as it does at the start of the reaction.

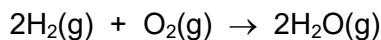
A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

15 Four students collect the gas produced from the reaction of calcium carbonate with dilute hydrochloric acid. Each student records the time taken to collect a volume of gas.

Which results show the highest average rate of reaction?

A 15 cm³ of gas collected in 20 seconds
B 50 cm³ of gas collected in 40 seconds
C 75 cm³ of gas collected in 80 seconds
D 90 cm³ of gas collected in 100 seconds

16 The equation for the reaction between hydrogen and oxygen is shown.



Which statement explains why this is a redox reaction?

A Both oxidation and reduction take place.
B Heat energy is released to the surroundings.
C Hydrogen is a reactant.
D The reaction can be reversed.

17 Which statements about dilute ethanoic acid are correct?

- 1 It has a pH of 8.
- 2 It is an organic compound.
- 3 It turns universal indicator orange-yellow.
- 4 It reacts with magnesium to produce carbon dioxide.

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

18 An aqueous solution of Z turns universal indicator paper purple.

Which row identifies the colour of methyl orange and of thymolphthalein when they are added separately to an aqueous solution of Z?

	methyl orange	thymolphthalein
A	yellow	blue
B	yellow	colourless
C	red	blue
D	red	colourless

19 Which row describes the solubility of lead(II) chloride and lead(II) sulfate in water?

	lead(II) chloride	lead(II) sulfate
A	soluble	soluble
B	soluble	insoluble
C	insoluble	soluble
D	insoluble	insoluble

20 Four different groups of oxides are shown.



Which statement about these groups of oxides is correct?

A 1, 2 and 3 contain basic oxides only.

B 2, 3 and 4 contain basic oxides only.

C 1 contains basic oxides only, and 4 contains acidic oxides only.

D 1 contains acidic oxides only, and 4 contains basic oxides only.

21 Four steps in the preparation of a soluble salt from a dilute acid and a solid metal oxide are listed.

- 1 Warm the dilute acid.
- 2 Evaporate the solution to half of its volume and allow to cool.
- 3 Add excess metal oxide.
- 4 Filter to remove any unreacted solid.

What is the correct order for these steps?

A $1 \rightarrow 2 \rightarrow 3 \rightarrow 4$

B $1 \rightarrow 3 \rightarrow 4 \rightarrow 2$

C $3 \rightarrow 1 \rightarrow 2 \rightarrow 4$

D $3 \rightarrow 4 \rightarrow 1 \rightarrow 2$

22 Which pair of elements react together most violently?

A chlorine and lithium

B chlorine and potassium

C iodine and lithium

D iodine and potassium

23 Rubidium is an element in Group I of the Periodic Table.

Which row describes a physical property and a chemical property of rubidium?

	physical property	chemical property
A	hard	reacts with water
B	hard	does not react with water
C	soft	reacts with water
D	soft	does not react with water

24 Which row describes the state and colour of bromine at room temperature and pressure?

	state	colour
A	liquid	red-brown
B	liquid	grey-black
C	solid	red-brown
D	solid	grey-black

25 Part of the Periodic Table is shown.

Which element is a metal?

26 Which compound is made from elements that are **all** in the same period?

A $Al_2(SO_4)_3$ **B** C_2H_5OH **C** $LiNO_3$ **D** Na_3AlF_6

27 Silver metal is separately tested with cold water, with steam and with dilute hydrochloric acid.

Which row identifies the tests that show the chemical reactivity of silver?

	cold water	steam	dilute hydrochloric acid	
A	✓	✓	✓	key
B	✗	✓	✓	✓ = reaction
C	✗	✗	✓	✗ = no reaction
D	✗	✗	✗	

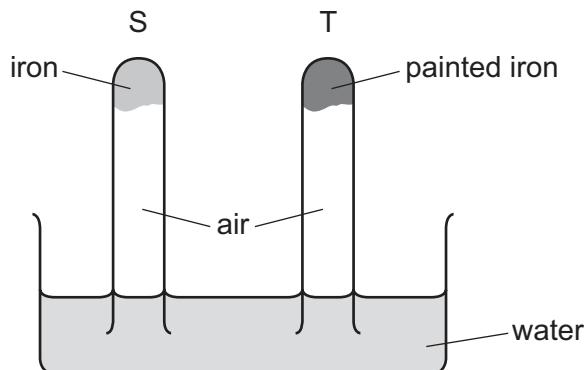
28 Which statement about the extraction of iron from hematite is correct?

- A Air is blown into the blast furnace to oxidise the molten iron.
- B Carbon dioxide is reduced by coke to carbon monoxide.
- C Hematite is oxidised by carbon to molten iron.
- D The slag produced is denser than molten iron.

29 What is an alloy?

- A a compound of two metallic elements
- B a compound of metallic and non-metallic elements
- C a mixture of a metal and at least one other element
- D a pure metallic element

30 The diagram shows an experiment to investigate how paint affects the rusting of iron.



What happens to the water level in tubes S and T?

	tube S	tube T
A	falls	rises
B	no change	rises
C	rises	falls
D	rises	no change

31 Which statement describes clean, dry air?

- A** It is a compound containing about 78% nitrogen and 21% oxygen only.
- B** It is a mixture of about 21% nitrogen and 78% oxygen only.
- C** It is a mixture of several gases, including nitrogen and oxygen.
- D** It is a compound containing nitrogen, oxygen, carbon dioxide and other gases.

32 Which word equation describes photosynthesis?

- A** carbon dioxide + water \rightarrow glucose + oxygen
- B** glucose + water \rightarrow carbon dioxide + oxygen
- C** carbon dioxide + oxygen \rightarrow glucose + water
- D** glucose + oxygen \rightarrow carbon dioxide + water

33 Some adverse effects caused by air pollutants are listed.

- acid rain
- photochemical smog
- respiratory problems

Which air pollutant contributes to **all three** of these adverse effects?

A carbon monoxide

B oxides of nitrogen

C methane

D particulates

34 Petroleum is an important raw material that is separated into useful products.

Which terms describe petroleum and the method used to separate it?

	description	separation method
A	compound	cracking
B	compound	fractional distillation
C	mixture	cracking
D	mixture	fractional distillation

35 Which statements about homologous series are correct?

- 1 All carboxylic acids have similar chemical properties.
- 2 All alcohols have the same molecular mass.
- 3 Ethane and ethene are members of the same homologous series.
- 4 Ethane and propane are members of the same homologous series.

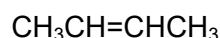
A 1 and 3 B 1 and 4 C 2 and 3 D 2 and 4

36 The formulae of two organic compounds, P and Q, are shown.

P



Q



Which type of organic compounds are P and Q?

	P	Q
A	alcohol	alkane
B	alcohol	alkene
C	carboxylic acid	alkane
D	carboxylic acid	alkene

37 Which fuel is manufactured by fermentation?

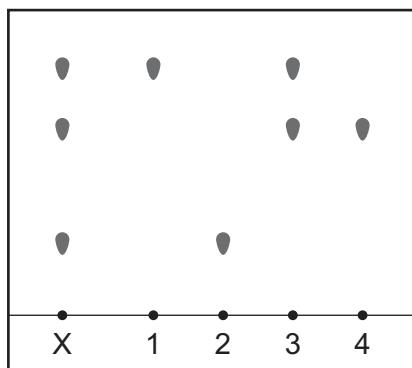
- A diesel
- B ethanol
- C hydrogen
- D kerosene

38 Which statement about the disposal of waste plastics is correct?

- A They are put in landfill sites, where they quickly decompose.
- B They are burned to produce non-toxic products.
- C They accumulate in oceans, where they are harmful to aquatic life.
- D They are dissolved in water and pumped into the sea.

39 Dyes are coloured substances.

The chromatogram of substance X and four different dyes, 1, 2, 3 and 4, is shown.



Substance X contains only **two** of the dyes 1, 2, 3 and 4.

Which **two** dyes are present in substance X?

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

40 The results of two tests on substance G are listed.

- A flame test produces a yellow flame.
- Substance G is added to aqueous sodium hydroxide and powdered aluminium and warmed carefully. A gas is given off which turns damp red litmus paper blue.

What is G?

A potassium chloride
B potassium nitrate
C sodium chloride
D sodium nitrate

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The Periodic Table of Elements

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37	Rb	38	Sr	39	Y	40	Zr	41	Nb	42	Mo	43	Ru	44	Rh	45	Pd	46	Ag	47	Cd	48	In	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	8010	8011	8012	8013	8014	8015	8016	8017	8018	8019	8020	8021	8022	8023	8024	8025	8026	8027	8028	8029	8030	8031	8032	8033	8034	8035	8036	8037	8038	8039	8040	8041	8042	8043	8044	8045	8046	8047	8048	8049	8050	8051	8052	8053	8054	8055	8056	8057	8058	8059	8060	8061	8062	8063	8064	8065	8066	8067	8068	8069	8070	8071	8072	8073	8074	8075	8076	8077	8078	8079	8080	8081	8082	8083	8084	8085	8086	8087	8088	8089	8090	8091	8092	8093	8094	8095	8096	8097	8098	8099	80100	80101	80102	80103	80104	80105	80106	80107	80108	80109	80110	80111	80112	80113	80114	80115	80116	80117	80118	80119	80120	80121	80122	80123	80124	80125	80126	80127	80128	80129	80130	80131	80132	80133	80134	80135	80136	80137	80138	80139	80140	80141	80142	80143	80144	80145	80146	80147	80148	80149	80150	80151	80152	80153	80154	80155	80156	80157	80158	80159	80160	80161	80162	80163	80164	80165	80166	80167	80168	80169	80170	80171	80172	80173	80174	80175	80176	80177	80178	80179	80180	80181	80182	80183	80184	80185	80186	80187	80188	80189	80190	80191	80192	80193	80194	80195	80196	80197	80198	80199	80200	80201	80202	80203	80204	80205	80206	80207	80208	80209	80210	80211	80212	80213	80214	80215	80216	80217	80218	80219	80220	80221	80222	80223	80224	80225	80226	80227	80228	80229	80230	80231	80232	80