



O-LEVEL Chemistry

REDOX

5070 - PAPER 1 MCQ

2026 EDITION

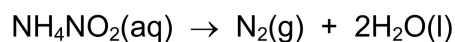
SECTION - OXIDATION NUMBERS

Q1

5070/11/O/N/21 Q20

Oxidation numbers - Hard

20 Aqueous ammonium nitrite, NH_4NO_2 , decomposes when heated.



In this salt, the anion is 1..... .

The nitrogen atoms in the 2..... ion are oxidised during the reaction.

Which formulae correctly complete gaps 1 and 2?

	1	2
A	NH_4^+	NH_4^+
B	NH_4^+	NO_2^-
C	NO_2^-	NH_4^+
D	NO_2^-	NO_2^-

Q2

5070/11/O/N/23 Q19

Oxidation numbers - Hard

19 In which substance does the nitrogen atom have the same oxidation number as the nitrogen atom in HNO_2 ?

Assume the following oxidation numbers for the other elements in these compounds: H, +1; F, -1; O, -2.

A NF_3

B NH_4^+

C NO

D NO_2^+

SECTION - OXIDATION NUMBERS

Q3

5070/11/O/N/24 Q18

Oxidation numbers - Hard

18 Copper forms a red oxide, Cu_2O , and a black oxide, CuO .

In the presence of a catalyst, aqueous hydrogen peroxide, H_2O_2 , decomposes to form water.

The black oxide has copper in a 1..... oxidation state than in the red oxide.

In forming water, hydrogen peroxide is 2..... .

Which words correctly complete gaps 1 and 2?

	1	2
A	higher	reduced
B	higher	oxidised
C	lower	reduced
D	lower	oxidised

SECTION - OXIDATION AND REDUCTION

Q4

5070/12/M/J/21 Q14

Oxidation and reduction - Easy

14 Molten sodium chloride is electrolysed.

Which change occurs at the cathode?

- A** Sodium ions are oxidised.
- B** Sodium ions are reduced.
- C** Chloride ions are oxidised.
- D** Chloride ions are reduced.

SECTION - OXIDATION AND REDUCTION

Q5

5070/12/M/J/22 Q23

Oxidation and reduction - Easy

23 What is an observation of an oxidation process?

- A** blue copper sulfate crystals turning to white powder when heated
- B** copper being deposited on the cathode during electrolysis
- C** green gas being produced at the anode when sodium chloride is electrolysed
- D** white precipitate forming when aqueous silver ions react with aqueous chloride ions

Q6

5070/11,12/O/N/22 Q24

Oxidation and reduction - Easy

24 Which change involves reduction?

- A** calcium carbonate to calcium oxide
- B** copper to brass
- C** ethene to poly(ethene)
- D** sand to silicon

Q7

5070/11/M/J/23 Q18

Oxidation and reduction - Easy

18 Which method of preparation of magnesium sulfate is an example of a redox reaction?

- A** $\text{Mg} + \text{H}_2\text{SO}_4 \rightarrow \text{MgSO}_4 + \text{H}_2$
- B** $\text{MgO} + \text{H}_2\text{SO}_4 \rightarrow \text{MgSO}_4 + \text{H}_2\text{O}$
- C** $\text{Mg}(\text{OH})_2 + \text{H}_2\text{SO}_4 \rightarrow \text{MgSO}_4 + 2\text{H}_2\text{O}$
- D** $\text{MgCO}_3 + \text{H}_2\text{SO}_4 \rightarrow \text{MgSO}_4 + \text{H}_2\text{O} + \text{CO}_2$

SECTION - OXIDATION AND REDUCTION

Q8

5070/11/O/N/23 Q28

Oxidation and reduction - Easy

28 Which statement about corrosion of metals is correct?

- A A barrier method is needed to prevent the corrosion of stainless steel.
- B Iron corrodes to produce hydrated iron(II) oxide.
- C Sacrificial protection uses a less reactive metal attached to the metal object that is being protected.
- D When corrosion occurs, the metal loses electrons to become positive ions.

Q9

5070/11/O/N/23 Q29

Oxidation and reduction - Easy

29 Some metals and the compounds in their ores are shown.

metal	Al	Ca	Pb	Na	Fe	Mg
compound in ore	Al ₂ O ₃	CaCO ₃	PbS	NaCl	Fe ₂ O ₃	MgCO ₃

Which type of reaction occurs in the extraction of each of these metals from its ore?

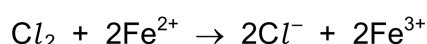
- A decomposition by heat
- B electrolysis
- C precipitation
- D reduction

Q10

5070/12/O/N/23 Q18

Oxidation and reduction - Easy

18 Chlorine, Cl₂, reacts with iron(II), Fe²⁺, ions.



Which statement about this reaction is correct?

- A Chlorine is oxidised.
- B Cl⁻ ions are formed by loss of electrons.
- C Fe²⁺ ions have gained electrons.
- D Fe³⁺ ions are formed by oxidation.

SECTION - OXIDATION AND REDUCTION

Q11

5070/11/M/J/24 Q21

Oxidation and reduction - Easy

21 Many reactions involve oxidation and reduction.

Which statement is correct?

- A Acidified manganate(VII) ions change colour from colourless to purple when reduced.
- B All reactions that involve oxidation also involve reduction.
- C During a reaction, oxidising agents lose electrons.
- D Reduction is the loss of hydrogen from a compound.

Q12

5070/12/M/J/24 Q20

Oxidation and reduction - Easy

20 Chlorine reacts with aqueous sodium bromide to form aqueous sodium chloride and bromine.

Which statement about this reaction is correct?

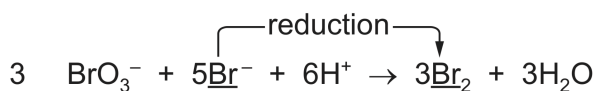
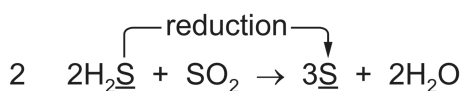
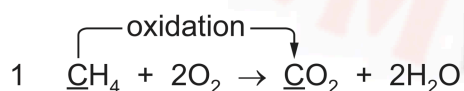
- A Bromide ions are oxidised because they lose electrons.
- B Chlorine atoms are oxidised because they gain electrons.
- C Sodium ions are oxidised because they lose electrons.
- D This reaction does **not** involve oxidation or reduction.

Q13

5070/11/M/J/21 Q20

Oxidation and reduction - Hard

20 In which equations is the change in the underlined species correct?



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

SECTION - OXIDATION AND REDUCTION

Q14

5070/12/O/N/21 Q20

Oxidation and reduction - Hard

20 Aqueous bromine is added to aqueous sodium chloride.

Which statement is correct?

- A** Bromine is oxidised and chloride ions are reduced.
- B** Bromine is reduced and chloride ions are oxidised.
- C** Neither oxidation nor reduction takes place.
- D** Sodium ions are oxidised.

Q15

5070/11/M/J/22 Q24

Oxidation and reduction - Hard

24 The table gives some information about four redox reactions.

Which row gives correct information about what is oxidised and the evidence that this is oxidation?

	equation	what is oxidised in the reaction	evidence for this oxidation
A	$\text{CuO(s)} + \text{C(s)} \rightleftharpoons \text{CO(g)} + \text{Cu(s)}$	copper	copper oxide has given oxygen to carbon
B	$\text{Na(s)} + \frac{1}{2} \text{Cl}_2\text{(g)} \rightleftharpoons \text{NaCl(s)}$	sodium	sodium has lost an electron
C	$\text{N}_2\text{(g)} + 3\text{H}_2\text{(g)} \rightleftharpoons 2\text{NH}_3\text{(g)}$	nitrogen	nitrogen has gained hydrogen
D	$\text{Zn(NO}_3)_2\text{(aq)} + \text{Mg(s)} \rightleftharpoons \text{Mg(NO}_3)_2\text{(aq)} + \text{Zn(s)}$	zinc	zinc has gained two electrons

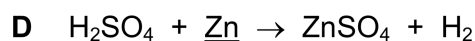
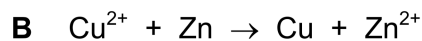
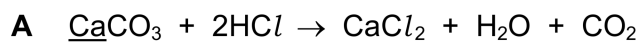
SECTION - OXIDATION AND REDUCTION

Q16

5070/11/O/N/22 Q23

Oxidation and reduction - Hard

23 In which reaction is the underlined substance reduced?

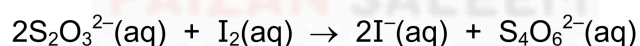


Q17

5070/11/O/N/22 Q25

Oxidation and reduction - Hard

25 Thiosulfate ions, $\text{S}_2\text{O}_3^{2-}$, react with iodine, I_2 , in aqueous solution.



In this reaction, the $\text{S}_2\text{O}_3^{2-}$ ions 1..... electrons and are 2..... .

Which words correctly complete gaps 1 and 2?

	1	2
A	gain	oxidised
B	gain	reduced
C	lose	oxidised
D	lose	reduced

SECTION - OXIDATION AND REDUCTION

Q18

5070/12/M/J/23 Q31

Oxidation and reduction - Hard

31 Pieces of magnesium can be attached to the steel hull of a ship to prevent rusting.

This is sacrificial protection.

Which statements about sacrificial protection are correct?

- 1 Iron atoms gain electrons and form hydrated iron(III) oxide.
- 2 Magnesium atoms gain electrons to form magnesium ions.
- 3 Magnesium is oxidised.

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

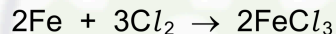
SECTION - OXIDISING AND REDUCING AGENTS

Q19

5070/12/O/N/22 Q25

Oxidising and reducing agents - Easy

25 Under certain conditions, iron reacts with chlorine to form iron(III) chloride.



Which statement about this reaction is correct?

- A** Chlorine is the oxidising agent.
- B** Iron gains electrons.
- C** Iron is reduced.
- D** This is **not** a redox reaction.

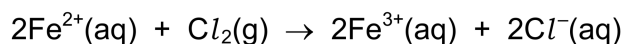
SECTION - OXIDISING AND REDUCING AGENTS

Q20

5070/12/M/J/23 Q19

Oxidising and reducing agents - Easy

19 Iron(II) ions react with chlorine.



Which statement about this reaction is correct?

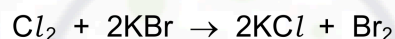
- A Chlorine is reduced by iron(II) ions.
- B Chlorine is the reducing agent.
- C Iron(II) ions are reduced by chlorine.
- D Iron(II) ions are the oxidising agent.

Q21

5070/11/M/J/24 Q22

Oxidising and reducing agents - Easy

22 The equation for a reaction is shown.



Which statement about this reaction is correct?

- A Bromide ions are the oxidising agent.
- B Bromine is the reducing agent.
- C Chloride ions are the reducing agent.
- D Chlorine is the oxidising agent.

Q22

5070/11/M/J/22 Q23

Oxidising and reducing agents - Hard

23 Concentrated hydrochloric acid is oxidised by manganese(IV) oxide, MnO_2 .

What are two products of this reaction?

- A Mn^{2+} and Cl^{-}
- B Mn^{2+} and Cl_2
- C Mn^{6+} and Cl^{-}
- D Mn^{6+} and Cl_2

SECTION - REDOX TESTS AND COLOUR CHANGES

Q23

5070/12/M/J/23 Q20

Redox tests and colour changes - Easy

20 Which reagent and observation describes the test for a reducing agent?

	reagent	colour change
A	acidified aqueous potassium manganate(VII)	colourless to purple
B	acidified aqueous potassium manganate(VII)	purple to colourless
C	aqueous potassium iodide	colourless to purple
D	aqueous potassium iodide	purple to colourless

Q24

5070/11/O/N/25 Q22

Redox tests and colour changes - Easy

22 Chlorine gas is bubbled into separate samples of aqueous potassium iodide and aqueous potassium bromide.

In which solutions is there a colour change?

	aqueous potassium iodide	aqueous potassium bromide
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key

✓ = yes

✗ = no

SECTION - REDOX TESTS AND COLOUR CHANGES

Q25

5070/12/O/N/25 Q18

Redox tests and colour changes - Easy

18 Acidified aqueous potassium manganate(VII) is used as a test reagent.

When it is added to an aqueous solution of compound M, the colour of the test reagent changes from 1..... . This colour change shows that M is 2..... .

Which words correctly complete gaps 1 and 2?

	1	2
A	colourless to purple	oxidised
B	colourless to purple	reduced
C	purple to colourless	oxidised
D	purple to colourless	reduced

Q26

5070/12/M/J/21 Q20

Redox tests and colour changes - Hard

20 Solution X is colourless. A few drops of aqueous potassium iodide solution are added to a sample of X. No change is seen.

Solution Y is colourless. A few drops of aqueous acidified potassium manganate(VII) solution are added to a sample of Y. The colour of the potassium manganate(VII) disappears.

What can be deduced about X and Y from these two observations?

- A** X and Y are both reducing agents.
- B** X is an oxidising agent and Y is **not** a reducing agent.
- C** X is **not** a reducing agent and Y is an oxidising agent.
- D** X is **not** an oxidising agent and Y is a reducing agent.

SECTION - REDOX TESTS AND COLOUR CHANGES

Q27

5070/12/M/J/22 Q24

Redox tests and colour changes - Hard

24 An excess of aqueous iodide ions is added to acidified aqueous potassium manganate(VII).

Which row is correct?

	iodide ions	colour of final solution
A	oxidised	colourless
B	oxidised	brown
C	reduced	colourless
D	reduced	brown



MARKING SCHEME

Q	ANS	Paper Number
Q1	C	5070/11/O/N/21 Q20
Q2	A	5070/11/O/N/23 Q19
Q3	A	5070/11/O/N/24 Q18
Q4	B	5070/12/M/J/21 Q14
Q5	C	5070/12/M/J/22 Q23
Q6	D	5070/11,12/O/N/22 Q24
Q7	A	5070/11/M/J/23 Q18
Q8	D	5070/11/O/N/23 Q28
Q9	D	5070/11/O/N/23 Q29
Q10	D	5070/12/O/N/23 Q18
Q11	B	5070/11/M/J/24 Q21
Q12	A	5070/12/M/J/24 Q20
Q13	A	5070/11/M/J/21 Q20
Q14	C	5070/12/O/N/21 Q20
Q15	B	5070/11/M/J/22 Q24
Q16	B	5070/11/O/N/22 Q23
Q17	C	5070/11/O/N/22 Q25
Q18	D	5070/12/M/J/23 Q31
Q19	A	5070/12/O/N/22 Q25
Q20	A	5070/12/M/J/23 Q19
Q21	D	5070/11/M/J/24 Q22
Q22	B	5070/11/M/J/22 Q23
Q23	B	5070/12/M/J/23 Q20
Q24	A	5070/11/O/N/25 Q22
Q25	C	5070/12/O/N/25 Q18
Q26	D	5070/12/M/J/21 Q20
Q27	B	5070/12/M/J/22 Q24