

1 Which of these shows nitrogen in its correct oxidation states in the compounds given?

	NH_3	N_2O	HNO_2	
A	+3	-1	+5	<input type="checkbox"/>
B	-3	+1	+3	<input type="checkbox"/>
C	-3	+1	-5	<input type="checkbox"/>
D	+3	-1	-3	<input type="checkbox"/>

(Total 1 mark)

2 Which species contains an element with an oxidation state of +4?

- A NO_2^+
- B ClO_3^-
- C H_2SO_3
- D PCl_5

(Total 1 mark)

3 Which of the following shows chlorine in its correct oxidation states in the compounds shown?

	HCl	KClO_3	HClO	
A	-1	+3	+1	<input type="checkbox"/>
B	+1	-5	-1	<input type="checkbox"/>
C	-1	+5	+1	<input type="checkbox"/>
D	+1	+5	-1	<input type="checkbox"/>

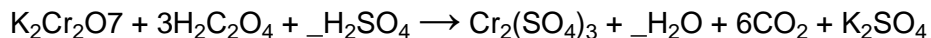
(Total 1 mark)

4 Which one of the following is **not** a redox reaction?

- A $\text{Br}_2 + \text{SO}_2 + 2\text{H}_2\text{O} \rightarrow \text{SO}_4^{2-} + 4\text{H}^+ + 2\text{Br}^-$
- B $\text{SnCl}_2 + \text{HgCl}_2 \rightarrow \text{Hg} + \text{SnCl}_4$
- C $\text{Cu}_2\text{O} + \text{H}_2\text{SO}_4 \rightarrow \text{CuSO}_4 + \text{Cu} + \text{H}_2\text{O}$
- D $2\text{CrO}_4^{2-} + 2\text{H}^+ \rightarrow \text{Cr}_2\text{O}_7^{2-} + \text{H}_2\text{O}$

(Total 1 mark)

5 Refer to the unbalanced equation below when answering this question.



What is the reducing agent in this reaction?

- A H^+
- B $\text{C}_2\text{O}_4^{2-}$
- C K^+
- D $\text{Cr}_2\text{O}_7^{2-}$

(Total 1 mark)

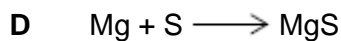
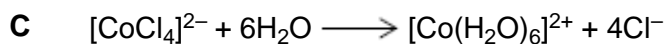
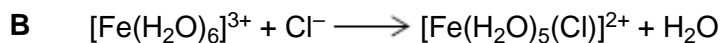
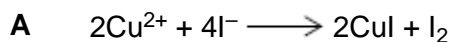
6 In which reaction is hydrogen acting as an oxidising agent?

- A $\text{Cl}_2 + \text{H}_2 \longrightarrow 2\text{HCl}$
- B $(\text{CH}_3)_2\text{CO} + \text{H}_2 \longrightarrow (\text{CH}_3)_2\text{CHOH}$
- C $\text{N}_2 + 3\text{H}_2 \longrightarrow 2\text{NH}_3$
- D $2\text{Na} + \text{H}_2 \longrightarrow 2\text{NaH}$

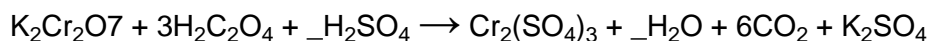
(Total 1 mark)

7

In which reaction is the metal oxidised?

**(Total 1 mark)****8**

Refer to the unbalanced equation below when answering this question.



In the balanced equation the mole ratio for sulfuric acid to water is

A 1 : 4

B 1 : 2

C 4 : 7

D 4 : 9

(Total 1 mark)**9**

Photochromic glass contains silver ions and copper ions. A simplified version of a redox equilibrium is shown below. In bright sunlight the high energy u.v. light causes silver atoms to form and the glass darkens. When the intensity of the light is reduced the reaction is reversed and the glass lightens.



clear glass

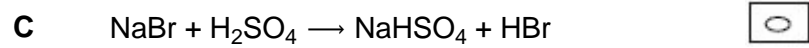
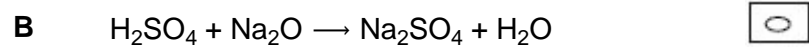
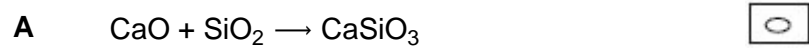
dark glass

When the photochromic glass darkens

A the Ag^+ ion is acting as an electron donor.B the Cu^+ ion is acting as a reducing agent.C the Ag^+ ion is oxidised.D the Cu^+ ion is reduced.**(Total 1 mark)**

10

Which of these is a redox reaction?



(Total 1 mark)

Mark schemes

1	B		[1]
2	C	[1]	
3	C		[1]
4	D		[1]
5	B	[1]	
6	D		[1]
7	D		[1]
8	C	[1]	
9	B		[1]
10	D		[1]