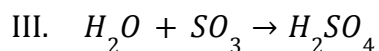
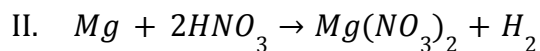
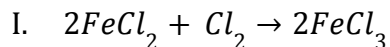


Topic 9.1AB Oxidation & Reduction

Past Exam Questions (Paper 1)

1. [1 mark]

Which are redox reactions?



- A. I and II only
- B. I and III only
- C. II and III only
- D. I, II and III

2. [1 mark]

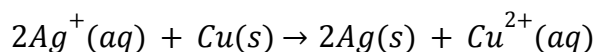
Metal M has only one oxidation number and forms a compound with the formula MCO_3 .

Which formula is correct?

- A. MNO_3
- B. MNH_4
- C. MSO_4
- D. MPO_4

3. [1 mark]

Which species is oxidized in the following reaction?



- A. Ag^+
- B. Cu
- C. Ag
- D. Cu^{2+}

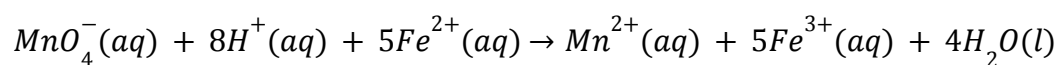
4. [1 mark]

Which compound contains nitrogen with an oxidation number of +3?

- A. NH_4Cl
- B. HNO_3
- C. N_2O_4
- D. KNO_2

5. [1 mark]

Consider the following reaction.



Which statement is correct?

- A. MnO_4^- is the oxidizing agent and it loses electrons.
- B. MnO_4^- is the reducing agent and it loses electrons.
- C. MnO_4^- is the oxidizing agent and it gains electrons.
- D. MnO_4^- is the reducing agent and it gains electrons.

6. [1 mark]

In which species does sulfur have an oxidation number of 0?

- A. SO_3
- B. S_8
- C. Na_2SO_4
- D. H_2S

7. [1 mark]

Which of the following redox reactions take place?

- I. $Cl_2(aq) + 2NaI(aq) \rightarrow I_2(aq) + 2NaCl(aq)$
- II. $Br_2(aq) + 2NaI(aq) \rightarrow I_2(aq) + 2NaBr(aq)$
- III. $I_2(aq) + 2NaBr(aq) \rightarrow Br_2(aq) + 2NaI(aq)$
- A. I and II only
- B. I and III only
- C. II and III only
- D. I, II and III

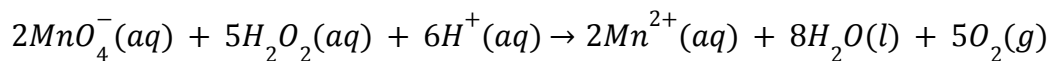
8. [1 mark]

Which species could be reduced to form NO_2 ?

- A. N_2O
- B. NO_3^-
- C. HNO_2
- D. NO

9. [1 mark]

What happens to the manganese in the following reaction?



- A. It is oxidized and its oxidation number increases.
- B. It is oxidized and its oxidation number decreases.
- C. It is reduced and its oxidation number increases.
- D. It is reduced and its oxidation number decreases.

10. [1 mark]

What happens to iodine when iodate ions, IO_3^- , are converted to iodine molecules, I_2 ?

- A. It undergoes reduction and its oxidation number changes from -1 to 0
- B. It undergoes oxidation and its oxidation number changes from -1 to 0
- C. It undergoes reduction and its oxidation number changes from $+5$ to 0
- D. It undergoes oxidation and its oxidation number changes from $+5$ to 0

11. [1 mark]

What is the correct systematic name of MnO_2 ?

- A. Manganese(II) oxide
- B. Manganese(IV) oxide
- C. Magnesium(II) oxide
- D. Magnesium(IV) oxide

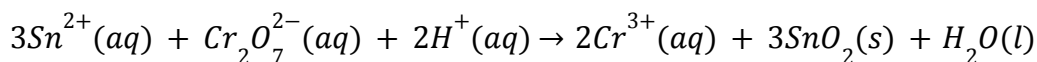
12. [1 mark]

What is the name of Cu_2S ?

- A. Copper(I) sulfide
- B. Copper(I) sulfate
- C. Copper(II) sulfide
- D. Copper(II) sulfate

13. [1 mark]

Consider the following reaction:



Which statement is correct?

- A. Sn^{2+} is the oxidizing agent because it undergoes oxidation.
- B. Sn^{2+} is the reducing agent because it undergoes oxidation.
- C. $\text{Cr}_2\text{O}_7^{2-}$ is the oxidizing agent because it undergoes oxidation.
- D. $\text{Cr}_2\text{O}_7^{2-}$ is the reducing agent because it undergoes oxidation.

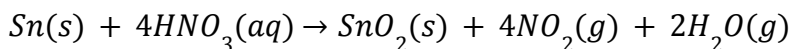
14. [1 mark]

What is the name of $\text{Co}_3(\text{PO}_4)_2$?

- A. Cobalt(II) phosphite
- B. Cobalt(II) phosphate
- C. Cobalt(III) phosphite
- D. Cobalt(III) phosphate

15. [1 mark]

Consider the following reaction.



Which statement is correct?

- A. HNO_3 is the oxidizing agent because it undergoes oxidation.
- B. HNO_3 is the reducing agent because the oxidation number of nitrogen changes from + 5 to + 4.
- C. Sn is the oxidizing agent because it undergoes reduction.
- D. Sn is the reducing agent because the oxidation number of tin changes from 0 to + 4.

16. [1 mark]

Which statement is correct about a reducing agent?

- A. It is reduced by gaining electrons.
- B. It is oxidized by gaining electrons.
- C. It is oxidized by losing electrons.
- D. It is reduced by losing electrons.

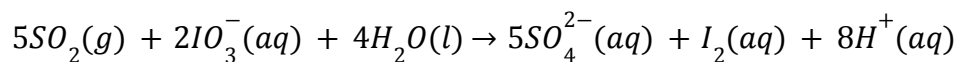
17. [1 mark]

Which statement describes a reducing agent?

- A. It is reduced and gains electrons.
- B. It is reduced and loses electrons.
- C. It is oxidized and gains electrons.
- D. It is oxidized and loses electrons.

18. [1 mark]

Which is the oxidizing agent in the following reaction?



- A. SO_2
- B. IO_3^-
- C. H_2O
- D. SO_4^{2-}

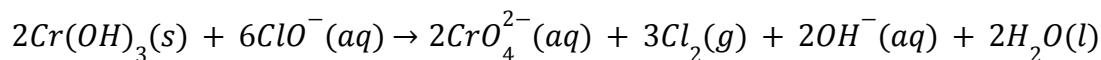
19. [1 mark]

What is the name of MnO_2 ?

- A. Manganese(II) oxide
- B. Magnesium(II) oxide
- C. Manganese(IV) oxide
- D. Magnesium(IV) oxide

20. [1 mark]

Consider the following reaction.



Which statement is correct?

- A. $\text{Cr}(\text{OH})_3$ is the oxidizing agent and the oxidation number of chromium changes from +3 to +6.
- B. $\text{Cr}(\text{OH})_3$ is the reducing agent and undergoes reduction.
- C. ClO^- is the oxidizing agent and the oxidation number of chlorine changes from +1 to 0.
- D. ClO^- is the reducing agent and the oxidation number of chlorine changes from -1 to 0.

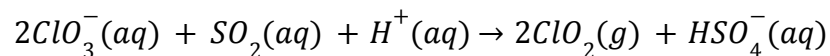
21. [1 mark]

Which species of vanadium has a different oxidation number from the rest?

- A. VO_2^+
- B. VO_3^-
- C. V_2O_5
- D. VO^{2+}

22. [1 mark]

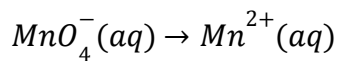
Which statement is correct for the following reaction?



- A. ClO_3^- is the oxidizing agent and it undergoes reduction.
- B. ClO_3^- is the reducing agent and it undergoes oxidation.
- C. SO_2 is the oxidizing agent and it undergoes oxidation.
- D. SO_2 is the reducing agent and it undergoes reduction.

23. [1 mark]

At which side of the equation are electrons, H^+ ions and H_2O needed to complete the half-equation?



	Electrons	H^+ ions	H_2O
A.	reactant side	reactant side	product side
B.	reactant side	product side	reactant side
C.	product side	reactant side	product side
D.	product side	product side	reactant side

24. [1 mark]

What are the correct names for $KMnO_4$ and $K_2Cr_2O_7$, using oxidation numbers?

- A. Potassium permanganate and potassium dichromate
- B. Potassium manganate(IV) and potassium chromate(VII)
- C. Potassium permanganate(IV) and potassium dichromate(VII)
- D. Potassium manganate(VII) and potassium dichromate(VI)

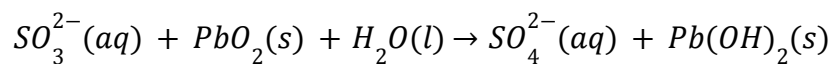
25. [1 mark]

What are the correct oxidation numbers of chromium in $Cr_2O_7^{2-}$ and manganese in $KMnO_4$?

	Chromium in $Cr_2O_7^{2-}$	Manganese in $KMnO_4$
A.	+7	+7
B.	+6	+7
C.	+6	+4
D.	+7	+4

26. [1 mark]

Which species are the oxidizing and reducing agents in the following reaction?



	Oxidizing agent	Reducing agent
A.	PbO_2	H_2O
B.	SO_3^{2-}	PbO_2
C.	H_2O	SO_3^{2-}
D.	PbO_2	SO_3^{2-}

27. [1 mark]

Which represents a redox reaction?

- A. $\text{NaH}(\text{s}) + \text{H}_2\text{O}(\text{l}) \rightarrow \text{NaOH}(\text{aq}) + \text{H}_2(\text{g})$
- B. $\text{CaCO}_3(\text{s}) \rightarrow \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$
- C. $\text{CuCl}_2(\text{aq}) + \text{K}_2\text{S}(\text{aq}) \rightarrow \text{CuS}(\text{s}) + 2\text{KCl}(\text{aq})$
- D. $\text{HCl}(\text{aq}) + \text{NH}_3(\text{aq}) \rightarrow \text{NH}_4^+\text{Cl}^-(\text{aq})$

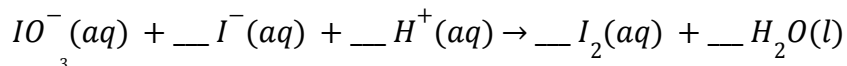
28. [1 mark]

What are the oxidation states of each element in K_2CrO_4 ?

	Potassium	Chromium	Oxygen
A.	+1	+6	-2
B.	-1	+6	-2
C.	+1	-6	+2
D.	-1	-6	+2

29. [1 mark]

What is the coefficient for I^- when the following equation is balanced using the smallest possible whole numbers?



- A. 1
- B. 2
- C. 3
- D. 5

30. [1 mark]

Which represents a redox reaction?

- A. $NaH(s) + H_2O(l) \rightarrow NaOH(aq) + H_2(g)$
- B. $CaCO_3(s) \rightarrow CaO(s) + CO_2(g)$
- C. $CuCl_2(aq) + K_2S(aq) \rightarrow CuS(s) + 2KCl(aq)$
- D. $HCl(aq) + NH_3(aq) \rightarrow NH_4^+Cl^-(aq)$

31. [1 mark]

Which is a redox reaction?

- A. $[Cu(H_2O)_4]^{2+}(aq) + 4Cl^-(aq) \rightarrow [CuCl_4]^{2-}(aq) + 4H_2O(l)$
 - B. $Ag^+(aq) + Cl^-(aq) \rightarrow AgCl(s)$
 - C. $Zn(s) + 2HCl(aq) \rightarrow ZnCl_2(aq) + H_2(g)$
 - D. $2K_2CrO_4(aq) + 2HCl(aq) \rightarrow K_2Cr_2O_7(aq) + H_2O(l) + 2KCl(aq)$
-