



Answer the questions below then check your answers

1. Oxidation is defined as:

- a) Gain of electrons
- b) Loss of electrons
- c) Gain of oxygen
- d) Loss of hydrogen

2. Reduction is defined as:

- a) Gain of electrons
- b) Loss of electrons
- c) Gain of oxygen
- d) Loss of hydrogen

3. An oxidising agent is a substance that:

- a) Gains electrons
- b) Loses electrons
- c) Causes oxidation
- d) Causes reduction

4. A reducing agent is a substance that:

- a) Gains electrons
- b) Loses electrons
- c) Causes oxidation
- d) Causes reduction

5. In the reaction:



which species is oxidised?

- a) Zn      b)  $\text{Cu}^{2+}$       c)  $\text{Zn}^{2+}$       d) Cu

6. In the reaction



which species is reduced?

- a) Zn      b)  $\text{Cu}^{2+}$       c)  $\text{Zn}^{2+}$       d) Cu

7. What is the oxidation number of chromium in  $\text{Cr}_2\text{O}_7^{2-}$ ?

- a) +3      b) +6      c) +7      d) +12

8. What is the oxidation number of manganese in  $\text{MnO}_4^-$ ?

- a) +4      b) +5      c) +6      d) +7

9. Which of the following is a strong oxidizing agent?

- a)  $\text{H}_2\text{O}$       b) HCl      c)  $\text{KMnO}_4$       d)  $\text{Na}_2\text{SO}_3$

10. Which of the following is a good reducing agent?

- a)  $\text{Cl}_2$       b)  $\text{H}_2\text{SO}_4$       c)  $\text{K}_2\text{Cr}_2\text{O}_7$       d)  $\text{Fe}^{2+}$

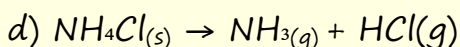
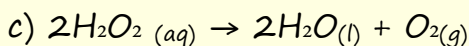
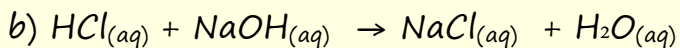
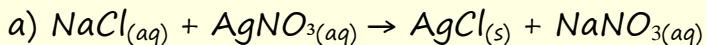
11. In the reaction between acidified  $\text{KMnO}_4$  and  $\text{Fe}^{2+}$ , the colour change observed is:

- a) Purple to green      b) Purple to colourless  
c) Orange to green      d) No colour change

12. In the reaction between acidified  $K_2Cr_2O_7$  and  $Fe^{2+}$ , the colour change observed is:

- a) Purple to green      b) Purple to colourless  
c) Orange to green      d) No colour change

13. Which of the following is a redox reaction?



14. When zinc reacts with dilute sulfuric acid, the products are:

- a)  $ZnSO_4$  and  $H_2$       b)  $ZnSO_4$  and  $O_2$   
c)  $ZnO$  and  $H_2$       d)  $ZnO$  and  $O_2$

15. The oxidation number of chlorine in  $HClO$  is:

- a) -1      b) +1      c) +3      d) +5

16. The oxidation number of sulfur in  $H_2SO_4$  is:

- a) +2      b) +4      c) +6      d) +8

17. Which of the following is NOT a redox reaction?

- a) Displacement of copper from copper(II) sulfate solution by zinc
- b) Combustion of methane
- c) Neutralization of hydrochloric acid with sodium hydroxide
- d) Corrosion of iron

18. Which of the following is the strongest oxidising agent?

- a)  $F_2$
- b)  $Cl_2$
- c)  $Br_2$
- d)  $I_2$

19. Which of the following is the strongest reducing agent?

- a)  $Li$
- b)  $Na$
- c)  $K$
- d)  $Rb$

20. In the reaction between acidified  $KMnO_4$  and sulfur dioxide ( $SO_2$ ), the oxidation product of sulfur dioxide is:

- a)  $SO_3$
- b)  $H_2SO_4$
- c)  $H_2S$
- d)  $S$

21. The oxidation number of nitrogen in  $HNO_3$  is:

- a) +1
- b) +3
- c) +5
- d) +7

22. The oxidation number of carbon in  $CO_2$  is:

- a) +1
- b) +2
- c) +3
- d) +4

## Answers

1. Oxidation is defined as:

- a) Gain of electrons
- b) Loss of electrons
- c) Gain of oxygen
- d) Loss of hydrogen

Answer: b) Loss of electrons

2. Reduction is defined as:

- a) Gain of electrons
- b) Loss of electrons
- c) Gain of oxygen
- d) Loss of hydrogen

Answer: a) Gain of electrons

3. An oxidising agent is a substance that:

- a) Gains electrons
- b) Loses electrons
- c) Causes oxidation
- d) Causes reduction

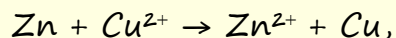
Answer: c) causes oxidation

4. A reducing agent is a substance that:

- a) Gains electrons
- b) Loses electrons
- c) Causes oxidation
- d) Causes reduction

Answer: d) causes reduction

5. In the reaction:

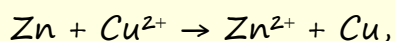


which species is oxidised?

- a) Zn      b)  $\text{Cu}^{2+}$       c)  $\text{Zn}^{2+}$       d) Cu

Answer: a) Zn

6. In the reaction



which species is reduced?

- a) Zn      b)  $\text{Cu}^{2+}$       c)  $\text{Zn}^{2+}$       d) Cu

Answer: b)  $\text{Cu}^{2+}$

7. What is the oxidation number of chromium in  $\text{Cr}_2\text{O}_7^{2-}$ ?

- a) +3      b) +6      c) +7      d) +12

Answer: c) +6

8. What is the oxidation number of manganese in  $\text{MnO}_4^-$ ?

- a) +4      b) +5      c) +6      d) +7

Answer: d) +7

9. Which of the following is a strong oxidizing agent?

- a)  $\text{H}_2\text{O}$       b) HCl      c)  $\text{KMnO}_4$       d)  $\text{Na}_2\text{SO}_3$

Answer: c)  $\text{KMnO}_4$

10. Which of the following is a good reducing agent?

- a)  $\text{Cl}_2$       b)  $\text{H}_2\text{SO}_4$       c)  $\text{K}_2\text{Cr}_2\text{O}_7$       d)  $\text{Fe}^{2+}$

Answer: d)  $\text{Fe}^{2+}$

11. In the reaction between acidified  $\text{KMnO}_4$  and  $\text{Fe}^{2+}$ , the colour change observed is:

- a) Purple to green                      b) Purple to colourless

- c) Orange to green                      d) No colour change

Answer: b) Purple to colourless

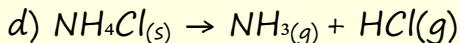
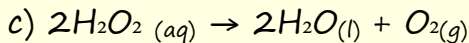
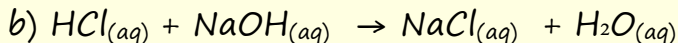
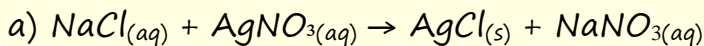
12. In the reaction between acidified  $\text{K}_2\text{Cr}_2\text{O}_7$  and  $\text{Fe}^{2+}$ , the colour change observed is:

- a) Purple to green                      b) Purple to colourless

- c) Orange to green                      d) No colour change

Answer: c) Orange to green

13. Which of the following is a redox reaction?



Answer : c)  $2\text{H}_2\text{O}_2_{(aq)} \rightarrow 2\text{H}_2\text{O}_{(l)} + \text{O}_2_{(g)}$

14. When zinc reacts with dilute sulfuric acid, the products are:

- a)  $\text{ZnSO}_4$  and  $\text{H}_2$       b)  $\text{ZnSO}_4$  and  $\text{O}_2$   
c)  $\text{ZnO}$  and  $\text{H}_2$       d)  $\text{ZnO}$  and  $\text{O}_2$

Answer: a)  $\text{ZnSO}_4$  and  $\text{H}_2$

15. The oxidation number of chlorine in  $\text{HClO}$  is:

- a) -1      b) +1      c) +3      d) +5

Answer: b) +1

16. The oxidation number of sulfur in  $\text{H}_2\text{SO}_4$  is:

- a) +2      b) +4      c) +6      d) +8

Answer: c) +6

17. Which of the following is not a redox reaction?

- a) Displacement of copper from copper(II) sulfate solution by zinc  
b) Combustion of methane  
c) Neutralization of hydrochloric acid with sodium hydroxide  
d) Corrosion of iron

Answer: c) Neutralization of hydrochloric acid with sodium hydroxide, no change in oxidation number for any reactant.



18. Which of the following is the strongest oxidising agent?

- a)  $F_2$       b)  $Cl_2$       c)  $Br_2$       d)  $I_2$

Answer: a)  $F_2$

19. Which of the following is the strongest reducing agent?

- a) Li      b) Na      c) K      d) Rb

Answer: a) Li

20. In the reaction between acidified  $KMnO_4$  and sulfur dioxide ( $SO_2$ ), the oxidation product of sulfur dioxide is:

- a)  $SO_3$       b)  $H_2SO_4$       c)  $H_2S$       d) S

Answer: a)  $SO_3$

21. The oxidation number of nitrogen in  $HNO_3$  is:

- a) +1      b) +3      c) +5      d) +7

Answer: c) +5

22. The oxidation number of carbon in  $CO_2$  is:

- a) +1      b) +2      c) +3      d) +4

Answer: d) +4