

## Grade 8 Chemistry Homework: Redox (Reduction-Oxidation) Reactions

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### I. Concept Overview

A redox reaction (short for reduction-oxidation) involves the **transfer of electrons** between substances. One substance **loses electrons** (oxidation), while another **gains electrons** (reduction). These two processes always occur together.

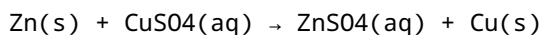
#### Key Points:

- **Oxidation:** Loss of electrons (OIL → Oxidation Is Loss)
  - **Reduction:** Gain of electrons (RIG → Reduction Is Gain)
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### II. Observation and Identification

Study the following reactions and related images carefully, then answer the questions.

#### Reaction 1:

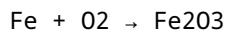


#### Figure 1: Zinc and Copper Reaction

Zinc and Copper Reaction

1. Which element is **oxidized**? \_\_\_\_
  2. Which element is **reduced**? \_\_\_\_
  3. Which is the **oxidizing agent**? \_\_\_\_
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#### Reaction 2:



#### Figure 2: Formation of Rust

Rusty Iron

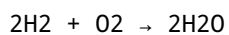
1. Which substance undergoes oxidation? \_\_\_\_
  2. Why does this reaction occur faster in humid conditions? \_\_\_\_
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### III. Multiple Choice Questions (2 points each)

1. In a redox reaction, oxidation involves:  
A) Gaining electrons  
B) Losing electrons  
C) Gaining protons  
D) Losing neutrons
  2. Which of the following is an example of a redox reaction?  
A) Salt dissolving in water  
B) Burning magnesium in air  
C) Ice melting  
D) Sugar dissolving in water
  3. When iron rusts, it undergoes:  
A) Reduction  
B) Oxidation  
C) Neither  
D) Both oxidation and reduction
  4. In the reaction  $2\text{Na} + \text{Cl}_2 \rightarrow 2\text{NaCl}$ , the **reducing agent** is:  
A) Na  
B) Cl<sub>2</sub>  
C) NaCl  
D) None
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### IV. Free Response Questions (5 points each)

1. In your own words, explain what happens to electrons in a redox reaction. Give an example to support your explanation.
2. Consider the following reaction:



#### Figure 3: Combustion of Hydrogen

Hydrogen Combustion

Identify:

- The substance oxidized: \_\_
- **The substance reduced:** \_

- *The oxidizing agent:* \_\_

- ***The reducing agent:*** \_

1. **(Challenge)** Hydrogen peroxide ( $\text{H}_2\text{O}_2$ ) can act as both an oxidizing and reducing agent. Explain how this is possible and provide one example for each case.
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## V. Applied Example: The Rusty Bicycle

### Figure 4: Rusty Bicycle

Rusty Bicycle

You find an old bicycle covered in rust. Knowing that rust is  $\text{Fe}_2\text{O}_3$ , answer the following:

1. What type of chemical change did the iron undergo?
2. What environmental conditions accelerated this process?
3. How can you prevent further rusting using the principles of redox chemistry? (Hint: Think about the “sacrificial metal” concept.)

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## VI. True or False (1 point each)

1. Oxidation means an atom gains electrons. (T / F)
  2. Oxidation and reduction always occur together. (T / F)
  3. The oxidizing agent is itself reduced. (T / F)
  4. Oxidation can happen without reduction. (T / F)
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## VII. Extension (Bonus Question)

Design a simple redox experiment that can be done safely at home — for example, using lemon juice and a steel nail. Describe your procedure and what you expect to observe.

### Figure 5: Lemon Battery Experiment

Lemon Battery

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## VIII. Reflection and Application

Describe three examples of redox reactions in daily life — such as in batteries, corrosion, respiration, or photosynthesis.