

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

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:

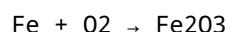


Figure 2: Formation of Rust

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) Cl₂
 - C) NaCl
 - D) None

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:

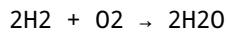


Figure 3: Combustion of Hydrogen

Hydrogen Combustion

Identify:

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

- *The oxidizing agent:* _____

- *The reducing agent:* _____

1. **(Challenge)** Hydrogen peroxide (H_2O_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 Fe_2O_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

VIII. Reflection and Application

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