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)

II. Observation and Identification

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

Reaction 1:

```
Zn(s) + CuSO4(aq) → ZnSO4(aq) + Cu(s)
```

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**? _____

Reaction 2:

```
Fe + O2 → Fe2O3
```

Figure 2: Formation of Rust
Rusty Iron

1. Which substance undergoes oxidation? _____
2. Why does this reaction occur faster in humid conditions? _____

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 `2Na + Cl2 → 2NaCl`, 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:

```
2H2 + O2 → 2H2O
```

Figure 3: Combustion of Hydrogen
Hydrogen Combustion

Identify:
- The substance oxidized: __
- The substance reduced: _

- The oxidizing agent: __
***- The reducing agent:** _*

1. (**Challenge**) Hydrogen peroxide (H2O2) can act as both an oxidizing and reducing agent. Explain how this is possible and provide one example for each case.

V. Applied Example: The Rusty Bicycle

Figure 4: Rusty Bicycle
Rusty Bicycle

You find an old bicycle covered in rust. Knowing that rust is Fe2O3, 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.)

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)

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.