47.1 Oxidation-Reduction Reactions

Chemistry

Summarize main points from each video.

Video Title / topic _____

Video Title / topic _____

Video Title / topic _____

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Topic Introduction

Summarize your understanding of each paragraph.

Electrochemistry plays an important part in our everyday lives. It is responsible for the rusting of iron, it explains how batteries power iPods (and also how we can recharge the batteries), and is used in countless other technologies.

The process in which a substance **loses an electron** in a chemical reaction is called oxidation. ... The atoms that lost electrons are said to be oxidized. Atoms can be oxidized by nonmetals.

Reduction is the **loss of oxygen atom** from a molecule or the **gaining of one or more electrons**.

A reduction reaction is seen from the point of view of the molecule being reduced, as when one molecule gets reduced another gets oxidized. The full reaction is known as a Redox reaction

Adapted from: https://en.wikiversity.org

Read/Summarize Text

1. **Read the passage.**
2. **Underline key expressions in each sentence.**
3. **Re-write each word (or expression) you underlined.**
4. **Summarize the passage.**

Quick Descriptions: Oxidation - Reduction

1

2

Oxidation is an increase in the oxidation state (a loss of electrons). In contrast, reduction is a decrease in oxidation state (or, a gain of electrons).

In this topic, students should examine how balancing oxidation-reduction reactions can be accomplished by more than one method.

- The trial and error method is commonly used as a first-try (this may be called the "inspection method" elsewhere).
- Another method is "half-reactions." A half reaction is achieved/calculated by considering the change in oxidation states of individual substances involved in the reaction.

Adapted from Honeycutt Science online virtual textbook.

Re-write words you underlined

3

_____ _____ _____

_____ _____ _____

Using a complete sentence, summarize or rephrase the passage

4

Read Text for Comprehension

Read this article for deeper understanding. No summary is required, although you may want to circle, underline, or mark key ideas and words.

REDOX REACTIONS: OXIDATION AND REDUCTION

Redox reactions — reactions in which there's a simultaneous transfer of electrons from one chemical species to another — are really composed of two different reactions: oxidation (a loss of electrons) and reduction (a gain of electrons).

REMEMBER

The electrons that are lost in the oxidation reaction are the same electrons that are gained in the reduction reaction. These two reactions are commonly called *half-reactions*; the overall reaction is called a *redox* (*red*uction/*ox*idation) reaction.

OXIDATION

There are three definitions you can use for oxidation:

- The loss of electrons
- The gain of oxygen
- The loss of hydrogen

REDUCTION

Like oxidation, there are three definitions you can use to describe reduction:

- The gain of electrons
- The loss of oxygen
- The gain of hydrogen

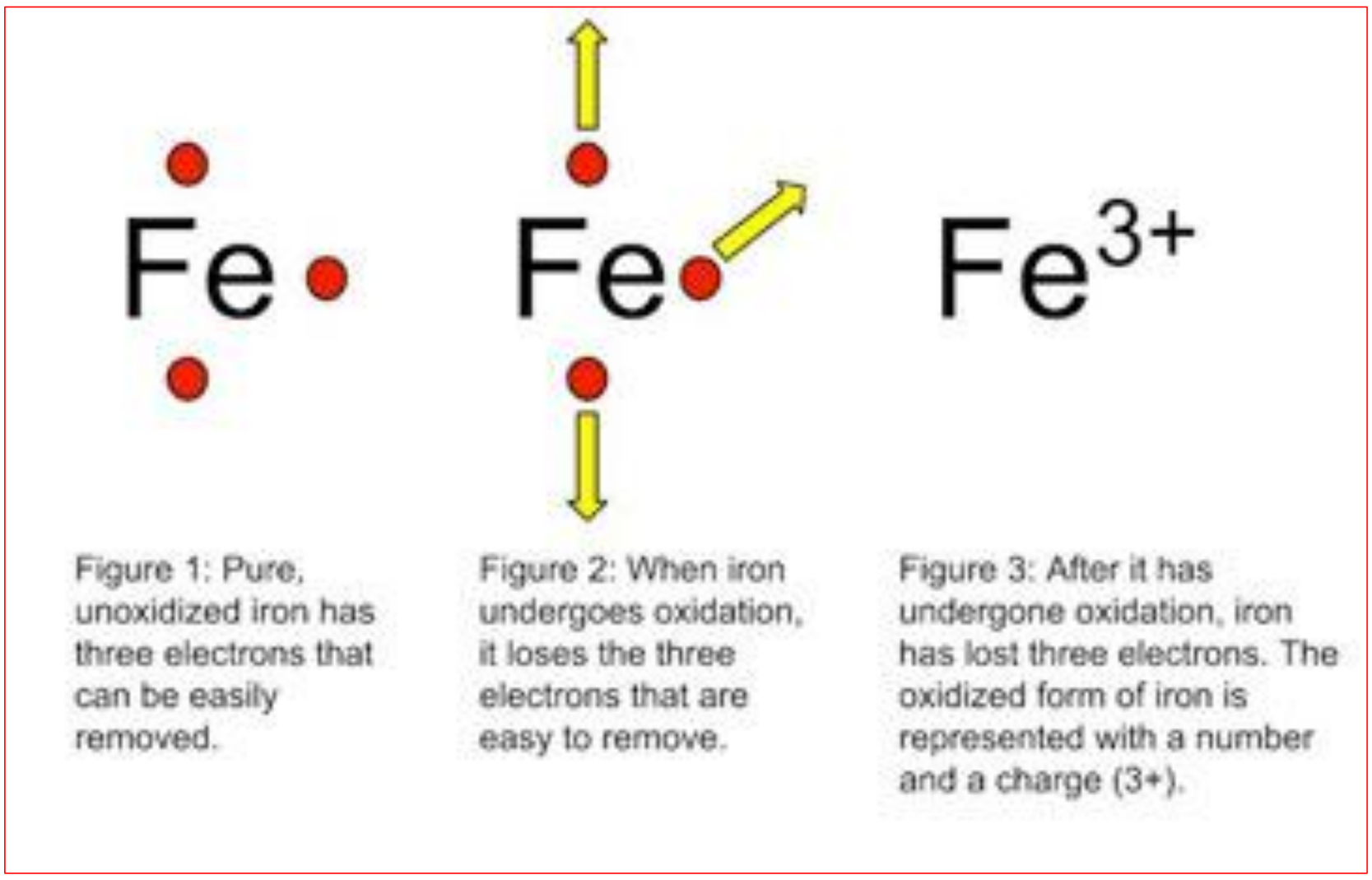
ONE'S LOSS IS THE OTHER'S GAIN

Neither oxidation nor reduction can take place without the other. When those electrons are lost, something has to gain them.

Selected extracts from: https://www.dummies.com

Draw Illustration

Copy and Label the Illustration in the Space Provided



https://study.com

Draw (Copy) the Illustration Here

Interpret a Graph

Write the title of the graph _____

Circle the type of chart this represents

Bar Chart *Line Chart* *Pie Chart* *Other*

If applicable,

What does the X-axis represent _____

What does the Y-axis imply _____

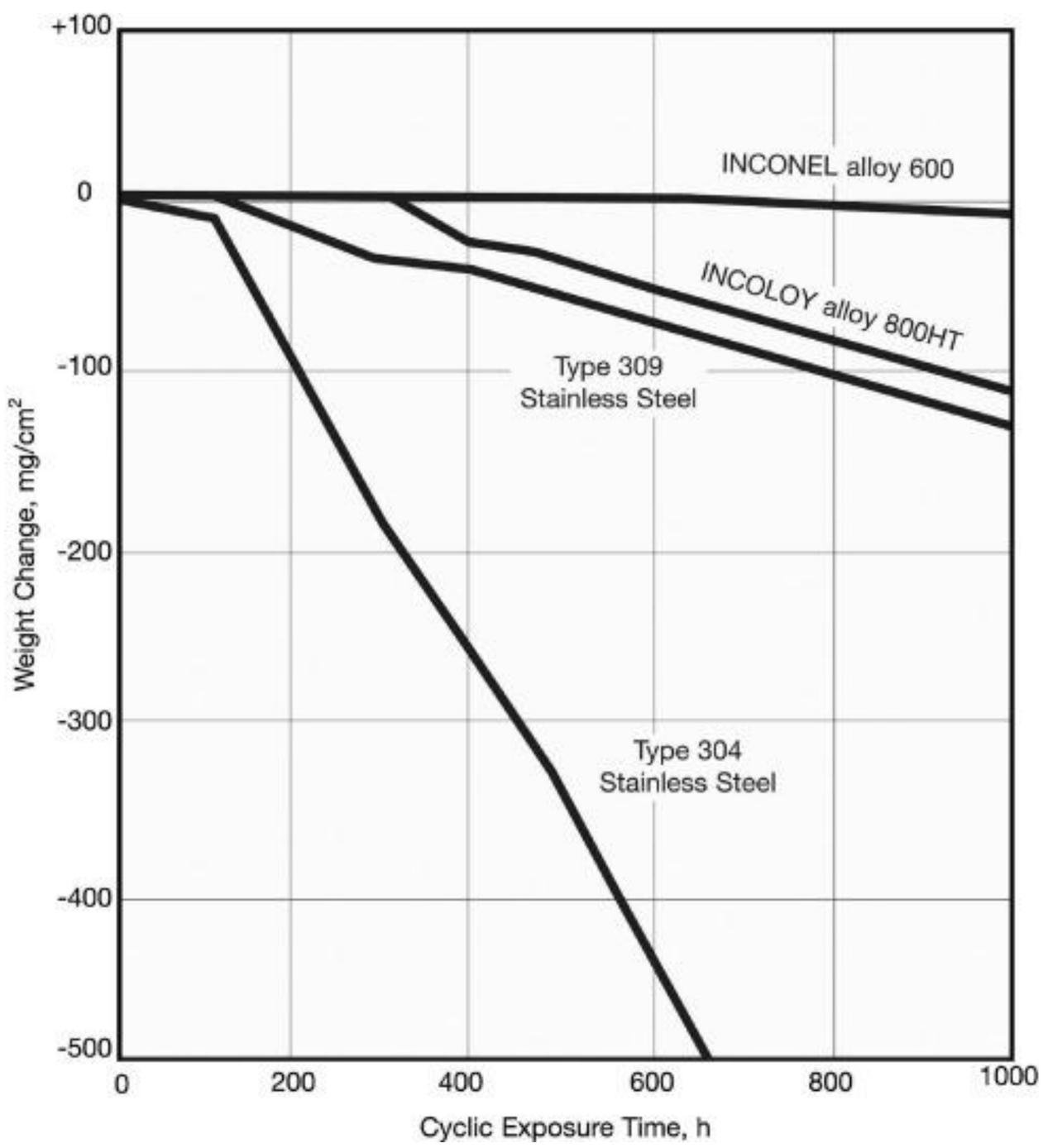
Summarize what this graph represents or conveys

_____

https://www.sciencedirect.com

Nickel shows superior oxidation resistance to carbon steels and copper alloys due to the formation of a nickel oxide film in air or other oxidizing environments.

Alloy 600 showed little weight change and was found to have better oxidation resistance than Type 304 or 310 stainless steels.



Show-Off Your Smarts!

Instructions

- Complete as an individual or small group.
- Prepare to present your responses to the class.

Q1. Identify (name) one REDOX example from every day living. Describe how this example impacts people.

Q2. Identify (name) one REDOX example related to materials used in the manufacturing of goods and products. (You may need to research this to confirm your idea). Describe how this example impacts people and their work.

Q3. Describe how YOU will remember redox – it's definition, what it is, and how it takes place.

Make a Poster

In the space provided here, create/draw a poster which conveys the concepts you have learned on this topic.