

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Chemistry ~ Ms. Hart Class: Anions or Cations



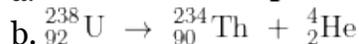
### 11.3 Oxidizing and Reducing Agents – Guided Notes

SPARK:

1. Is this a Redox Reaction?



2. Which equation represents an oxidation-reduction reaction?



**Objective:** SWBAT identify oxidizing agents and reducing agents in a redox reaction.

REVIEW:

**Redox reaction:** Reaction in which both \_\_\_\_\_ (gain of electrons) and \_\_\_\_\_ (loss of electrons) occurs.

**LEO** the Lion goes **GER**  **Loss of Electrons is Oxidation**  
**Gain of Electrons is Reduction**

Recognizing redox reactions

1. Assign oxidation numbers to each atom
2. If both reduction and oxidation occurs, it is a redox reaction

**REVIEW EXAMPLE:**  $\text{Cu}^{2+} + \text{Zn} \rightarrow \text{Cu} + \text{Zn}^{2+}$

	Reactant Side	Product Side
Element	Ox. State	Ox. State

\_\_\_\_\_ is reduced \_\_\_\_\_ is oxidized

### Oxidizing and Reducing “Agents”

- Agents are ALWAYS \_\_\_\_\_

**New Terms:**

Reducing Agent	
Oxidizing Agent	

CHECK YOURSELF: In review example what was being reduced? \_\_\_\_\_.

*This is the oxidizing agent!*

HOW DO I REMEMBER THIS??

## Ox. Red. Agent

- If the substance is \_\_\_\_\_ it is the \_\_\_\_\_.
- Or
- If the substance is \_\_\_\_\_ it is the \_\_\_\_\_.

**Quick check:** Does the reducing agent gain or lose electrons? How do you know? \_\_\_\_\_

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**PRACTICE #1:** Given the following:  $4 \text{ Fe} + 3 \text{ O}_2 \rightarrow 2 \text{ Fe}_2\text{O}_3$  ~ HINT: how do I find the charge of Fe?!

*Option 1...* reverse criss-cross

*Option 2...* make a table

Element				Total
Subscript (how many are there?)				
Oxidation State				
Sum of oxidation states				0

- What is being oxidized? \_\_\_\_\_
- What is being reduced? \_\_\_\_\_
- What is the oxidizing agent? \_\_\_\_\_
- What is the reducing agent? \_\_\_\_\_

**YOUR TURN** ~ LEO the lion goes GER

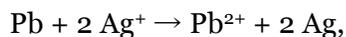
**#2:** Given the following:  $\text{Zn} + \text{Cu}^{2+} \rightarrow \text{Zn}^{2+} + \text{Cu}$

- What is being oxidized? \_\_\_\_\_
- What is being reduced? \_\_\_\_\_
- What is the oxidizing agent? \_\_\_\_\_
- What is the reducing agent? \_\_\_\_\_

#3: Given the following:  $\text{Mg} + \text{CuSO}_4 \rightarrow \text{MgSO}_4 + \text{Cu}$  (remember polyatomics are in Table E)

- a) What is being oxidized? \_\_\_\_\_
- b) What is being reduced? \_\_\_\_\_
- c) What is the oxidizing agent? \_\_\_\_\_
- d) What is the reducing agent? \_\_\_\_\_

4. In the reaction



the oxidizing agent is

- (1)  $\text{Ag}^+$
- (2)  $\text{Ag}$
- (3)  $\text{Pb}$
- (4)  $\text{Pb}^{2+}$

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**Independent Practice:**

5. An oxidation-reduction reaction involves the

- (1) transfer of electrons
- (2) transfer of protons
- (3) sharing of protons
- (4) sharing of electrons

6. Which balanced equation represents a redox reaction?

- (1)  $\text{AgNO}_3 + \text{NaCl} \rightarrow \text{AgCl} + \text{NaNO}_3$
- (2)  $\text{BaCl}_2 + \text{K}_2\text{CO}_3 \rightarrow \text{BaCO}_3 + 2\text{KCl}$
- (3)  $\text{CuO} + \text{CO} \rightarrow \text{Cu} + \text{CO}_2$
- (4)  $\text{HCl} + \text{KOH} \rightarrow \text{KCl} + \text{H}_2\text{O}$

7. What happens to reducing agents in chemical reactions?

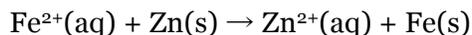
- (1) Reducing agents gain protons
- (2) Reducing agents gain electrons
- (3) Reducing agents are oxidized
- (4) Reducing agents are reduced

8. In a redox reaction, the oxidizing agent will

- (1) lose electrons and be reduced
- (2) lose electrons and be oxidized
- (3) gain electrons and be reduced
- (4) gain electrons and be oxidized

*Keep going... you can do it!*

9. Given the redox reaction:



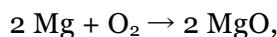
Which species acts as a reducing agent?

- (1) Fe(s)
- (2) Fe<sup>2+</sup>(aq)
- (3) Zn(s)
- (4) Zn<sup>2+</sup>(aq)

10. When a substance is oxidized, it

- (1) loses protons
- (2) gains protons
- (3) acts as an oxidizing agent
- (4) acts as a reducing agent

11. In the reaction



the magnesium is the

- (1) oxidizing agent and is reduced
- (2) oxidizing agent and is oxidized
- (3) reducing agent and is reduced
- (4) reducing agent and is oxidized

12. All redox reactions involve:

- (1) the gain of electrons only
- (2) the loss of electrons only
- (3) both the gain and the loss of electrons
- (4) neither the gain nor the loss of electrons

13. In the reaction



the reducing agent is

- (1) Zn
- (2) Fe<sup>2+</sup>
- (3) Zn<sup>2+</sup>
- (4) Fe

Explain your answer to number 13...

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