

Unit
11
Lesson
3

AIM

- What are half reactions?

AGENDA

- Intro to half reaction notes/practice
- U11L3 video

YOYO

- Pull up the U11L3 (unit 10 lesson 3) video on YouTube

HOMEWORK

- Nothing tonight
- Follow the calendar

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Is This Redox?

- $2\text{H}_2\text{O} \rightarrow 2\text{H}_2 + \text{O}_2$
- $\text{CH}_4 + 2\text{O}_2 \rightarrow 2\text{H}_2\text{O} + \text{CO}_2$
- $\text{HCl} + \text{NaOH} \rightarrow \text{H}_2\text{O} + \text{NaCl}$

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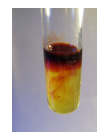
Half Reaction

- Half reaction shows the **exchange of electrons** in a redox reaction
- One half reaction shows **oxidation**, and the other shows **reduction**

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Example of a Reduction Half Reaction

- $\text{Fe}^{3+} + 3\text{e}^- \rightarrow \text{Fe}^0$
- Electrons on the left side, gained in the reaction

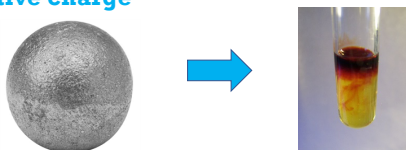


When $\text{Fe}^{3+}(\text{aq})$ gains 3 electrons, it produces iron solid $\text{Fe}(\text{s})$

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Example of an Oxidation Half Reaction

- $\text{Fe}^0 \rightarrow \text{Fe}^{3+} + 3\text{e}^-$
- Electrons are the right hand side, loss of electrons in the reaction
- Always **add electrons** to the side of the reaction that has a **more positive charge**



When iron solid $\text{Fe}(\text{s})$ loses 3 electrons, it produces $\text{Fe}^{3+}(\text{aq})$

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Complete the Incomplete Half Reactions

- Rewrite the equation and place the correct number of electrons on the appropriate side
- $\text{I}_2 \rightarrow 2\text{I}^-$
- $\text{Cr}^{2+} \rightarrow \text{Cr}^{3+}$
- $\text{Sr} \rightarrow \text{Sr}^{2+}$

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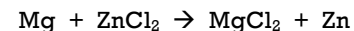
Following the Law of Conservation

- Half reactions follow:
 - Law of conservation of mass; **same # of atoms** on both sides of the reaction
 - Conservation of charge; **net charge must be the same** on both sides of the equation (# of electrons lost = # of electrons gained)

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Rules for Setting Up Half Reactions

- Assign numbers

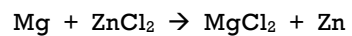


- Identify oxidation and reduction
 - _____ is oxidized because electrons were lost and the oxidation number increased
 - _____ is reduced because electrons were gained and the oxidation number decreased

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Rules for Setting Up Half Reactions

- Write the oxidation and reduction half reactions

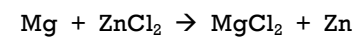


- Reduction Half Reaction:
- Oxidation Half Reaction:

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Rules for Setting Up Half Reactions

- Balance masses (change coefficients) and balance charge – multiply each half reaction to have the same number of electrons



- Reduction:
- Oxidation:

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