Balancing Redox Reactions – Reading Guide

*sections 4.2 and 17.1 in OpenStax*

**Oxidation-Reduction Reactions (Section 4.2 Review)**

Oxidation results in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*(increase or decrease)* in oxidation number.

Reduction results in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ *(increase or decrease)* in oxidation number.

Work through Example 4.5. Then, assign oxidation numbers to all atoms below and indicate which element is oxidized and which is reduced.

O2 (g) + 2 H2O (l) + 4 Ag (s) → 4 OH– (aq) + 4 Ag+ (aq)

**Balancing Reactions via the Half-reaction Method**

Using Example 4.7 in the textbook as a guide, describe each step and **show how** to balance the following equation in an acidic solution:

I– (aq) + NO2– (aq) → I2 (s) + NO(g)

Step 0: assign oxidation numbers to all elements to determine which element is oxidized and which element is reduced (*this is not included in the textbook, but it essential for Step #1*)

 I– (aq) + NO2– (aq) → I2 (s) + NO(g)

Step 1:

oxidation half reaction:

 reduction half reaction:

 Step 2:

 Step 3 & 4:

 Step 5 & 6:

 Step 7:

 (*Skip step #8 for acidic solutions*)

 Step 9: *check to make sure both atoms AND charge balance.*

***Watch the video tutorial on*** [Balancing Redox Reactions in Acidic Solution](http://screencast.com/t/nKHSteKVc5W)

**Balancing Reactions in a Basic Solution**

For a basic solution, there is one extra step (Step #8)

After adding the **balanced** half reactions, you need to add the same number of OH– to **BOTH** sides of the equation. This will neutralize all of the H+ into water in your balanced equation, removing all acid from the equation.

***Watch the video tutorial on*** [Balancing Redox Reactions in Basic Solution](http://screencast.com/t/mbrfebo1ZI)

Using example 17.2 in the textbook as a guide, show how to balance the following equation in a basic solution:

Al(s) + NO2-(aq) → AlO2-(aq) + NH3(g)

**End of Chapter 17 Practice Problems**

#3, 5a–b, 8a–b

For detailed solutions to the odd problems, go to the [OpenStax website](https://openstaxcollege.org/textbooks/chemistry/resources) and download the “Student Answer and Solution Guide.”