

Decomposition Reactions (Pg. 158)

What is a decomposition reaction?

Draw a visual representation of a decomposition reaction:

Summarize 1 of the decomposition reactions given in the textbook

Balancing Chemical Equations (Pg. 132)

Which of the tips in the textbook do you think are the best to follow when balancing chemical equations?

If you don't know what is produced, why is it important to check that the chemical formulas are electrically balanced before balancing an equation?

Hydrogen Peroxide and Manganese Dioxide

Materials: 30% hydrogen peroxide solution
Small beaker
1 tiny bit of manganese (IV) oxide

Procedure:

1. Pour one half dropper of hydrogen peroxide into a beaker
2. Move to the fume hood.
3. Drop a rice sized scoop of manganese dioxide into the beaker with the hydrogen peroxide.
4. Record your observations.

1. **Observations? What happened?**

2. What gasses are released during the decomposition of hydrogen peroxide?

3. **Balance this Chemical Equation:**



Ammonium dichromate $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$

<https://thekidshouldseethis.com/post/12031818927>

decomposes on heating to produce nitrogen gas, water vapor, and solid chromium (III) oxide (Cr_2O_3)

Materials: $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$ (s)
3 matches
crucible

Procedure:

1. Place $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$ (s) on a crucible
2. Submerge 2 matches in the ammonium dichromate.
3. Place crucible in a fumehood
4. Set match on $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$ (s) to start reaction.

1. **Observations? What happened?**

2. How many different substances were created in this reaction?

3. **Balance this Chemical Equation:**



The Decomposition of Water

Materials

- 400–600 mL beaker
- Water
- Sodium sulfate (Na_2SO_4)
- Two graphite electrodes
- Alligator clip wires
- DC power supply (6–12 V)

Safety

- Do not touch electrodes while power is on.
- Turn off the power supply before adjusting electrodes.

1. Prepare the Electrolyte

1. Fill the beaker halfway (~200 mL) with distilled water.
2. Add approximately **0.5 teaspoons of sodium sulfate (a small scoop)**.
3. Stir until dissolved.

2. Set Up the Circuit

1. Connect the **positive terminal (red)** of the power supply to one graphite electrode.
2. Connect the **negative terminal (black)** to the second graphite electrode.
3. Set the power supply to **6 V to start**.
4. Ensure electrodes are:
 - Not touching each other, About 1 cm apart

3. Begin Electrolysis

1. Turn on the power supply.
2. Slowly increase voltage (if needed) up until steady bubbling occurs.
3. Observe both electrodes carefully.

Observations

- Which electrode produces more bubbles?
- Are bubbles produced at both electrodes?
- Estimate the ratio of gas production. How much more oxygen is being produced?
- Why is sodium sulfate necessary, it's not part of the reaction?
- Why are twice as many bubbles produced at one electrode?

Balance this Chemical Equation:



Balance these Decomposition Equations:

