

1. Formation of Metal Oxides (also fits into the combustion category)**I. Magnesium reacts with oxygen**

- a. Observations:

- b. Reaction (net ionic is the same):

- c. Which element is oxidized and which element is reduced?

- d. Why is the flame required to start this reaction?

- e. What is the "smoke" that formed?

II. Iron reacts in air

- a. Observations:

Iron reacts in pure oxygen

Observations:

- b. Reaction [Assume the formation of iron(III)] (net ionic is the same):

- c. Why does the iron react more quickly and completely in pure oxygen than in just "air"?

- d. Which element is oxidized and which element is reduced?

2. Hydrogen Balloons

- a. Observations: (Compare and contrast the boom, the fireball and the candle after the reaction.)
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|-----------------------------|----------------------------|----------------------------------|
| Balloon with just air | Balloon with helium | Balloon with pure oxygen |
| Balloon with carbon dioxide | Balloon with pure hydrogen | Balloon with hydrogen and oxygen |
- b. Reaction: (Formation of water from its gaseous elements. This also fits into the combustion category.)
- c. Why was there a longer flame with the pure hydrogen balloon?
- d. Why was there a shorter flame yet a louder boom with the hydrogen and oxygen balloon?

3. (Electrolysis of Water) then Synthesis of Water

- a. Observations:
- b. Write the reaction for the decomposition of water.
- c. Write the reaction for the synthesis of water.
- d. What do you notice about these two reactions?
- e. Why do you suppose the pitch of the pop of this reaction was more of a bang compared to the hydrogen oxygen balloon as a boom? (Lets compare and contrast the popping noise made by large bubble wrap and small bubble wrap.)