Research Question: What happens in the combustion of a metal?

Introduction

A metal will undergo combustion when heated. In this lab, I will carry out a carefully controlled combustion reaction using a small amount of iron filling.

Procedures

Place aluminum foil under oil lamp. Fill oil lamp with ethanol and light with match. (Teacher should do this). Then, shake oil fillings from container into flame, being careful to not dump and to not peer over or into flame. Use phone if desired to take pictures during experiment. (Little sparks will occur so students should not be over the flame or try to use hands to capture sparks because they will get burned.) Once done, place metal top over flame to snuff out the flame.

Results:

This was the fillings before they were heated.

This is what the fillings looked like after they were heated.

Before the fillings were burned they were light gray, but after they were burned they turned dark to a brownish blackish color. Some of the fillings are dull/discolored.

<u>Conclusions</u>

A chemical reaction takes place when a metal burns. When the fillings were burned it created a new substance iron oxide. This is why the iron fillings changed colors.

The chemical equation for this reaction is:

$$4\ Fe_{(s)} + 3\ O_{2(g)} \rightarrow 2\ Fe_2O_{3(s)}$$

This is a combustion reaction. Oxygen is needed in this reaction because fire cant burn without oxygen.

Because the fillings were burned, it created a metal oxide.

Vocabulary to define:

Combustion reaction- a chemical reaction between substances, usually including oxygen and usually accompanied by the generation of heat and light in the form of flame.

Metal- any of a class of substances characterized by high electrical and thermal conductivity as well as by malleability, ductility, and high reflectivity of light.

Homonuclear diatomic- molecules made of exactly two identical atoms