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Combustion of Metal

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.

Procedure:

- Place aluminum foil under the oil lamp.
- Fill the oil lamp with ethanol and light it with a match.
- Then, shake iron fillings from the container into the flame, being careful not to dump and to not peer over or into the flame.
- Use a phone if desired to take pictures during the experiment.
- Once done, place the metal top over the flame to snuff out the flame.

Results:

Once the iron fillings interacted with the oil lamp, they caught on fire. Sparks started to fly out of the fillings like a firework. The sparks lasted for about 15 to 20 seconds. The sparks were an orange color and pretty big for the small amount of iron filling we used.

Conclusions:

The combustion of a metal is a chemical reaction. In this case, the new substance formed was iron oxide (rust). Therefore, some of the iron fillings appeared darker, or duller and discolored, in appearance.

The chemical equation for this reaction is:

$4\ Fe(s) + 3\ O2(g) \rightarrow 2\ Fe2O3(s)$

Combustion reactions need the presence of oxygen because fire requires oxygen to burn. Oxygen is the “fuel” of fire.

The combustion of metals results in a new substance, a metal oxide, being formed.

Vocabulary:

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