



Unexpected Reactions

The elements on the periodic table are more than letters and numbers on a chart. They have unique—and sometimes explosive—personalities. For example, did you know that hydrogen is extremely flammable and silver is actually a better conductor of electricity than copper?

Scientists use what they know about each element to help them predict what might happen during an experiment. Read the sidebar to learn about oxygen and iron. Then conduct the following experiment and test your hypothesis!

Investigation: Oxygen and Iron

Question: What will happen when steel wool is placed in vinegar?

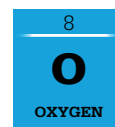
Hypothesis:

Materials: steel wool, vinegar, two beakers or glass jars, paper cut into a square large enough to cover the mouth of the beaker or jar, thermometer, timer or clock

Procedure:

1. Record the temperature of the thermometer when it is lying on the table. _____
2. Put the steel wool into an empty beaker or jar.
3. Carefully cover the steel wool with vinegar and allow it to soak for one minute.
4. Use tongs to remove the steel wool and wrap it around the base of a thermometer.
5. Place the thermometer and wool into the second beaker or jar and cover it.
6. Observe the jar or beaker for six minutes, recording the temperature on the thermometer every two minutes.

Conclusion:



Oxygen can be found in the water, the air, and within the earth's crust—it is vital for life. But oxygen is also very reactive. Burning, for example, is a reaction between a substance such as wood and the oxygen in the air.



Hard iron can be molded or beaten into almost any shape, making it the most useful of all the metals. Its main drawback is that, without protection, it can rust or combine with oxygen to become flaky and weak.

Use the classroom poster to see what these elements look like!

You just observed a chemical reaction. The vinegar removed the coating around the steel wool and exposed the iron inside. When oxygen from the air came into contact with the iron, it began to rust, causing an exothermic reaction that released energy as heat.