

Lesson 8: How Does Temperature Change During a Chemical Reaction?

Activity 8.1

Purpose

You have seen in the thermal clay activity that gravitational energy can be transferred to kinetic energy and that kinetic energy can be transferred to thermal energy when a can falls on a ball of clay. Today you will see another type of energy that can turn into thermal energy.

⊕ Safety

- Copper chloride can irritate your skin and eyes. If you get the liquid on your hands or in your eyes, flush it with cold water. Wear goggles at all times.
- Be careful of glassware. Notify the teacher if glassware breaks.
- Dispose of all chemicals in the sinks.

Word Wall:

Chemical Energy: _____

Review

In chemistry we learned that we can make new stuff from old stuff during a chemical reaction. The atoms of the reactants rearrange themselves to make a product. One of our indications of a chemical reaction was a change in temperature. It so happens that a temperature change is related to thermal energy.

You will once again combine aluminum foil with copper chloride and you will also combine steel wool with copper chloride. Rather than focusing on the new substances made in a chemical reaction, you will focus on the transfer of chemical energy into thermal energy.

Procedure

1. Put on your goggles.
2. Take a beaker containing 50 ml of copper chloride from the table. Carefully carry it to your lab table.
3. Place a thermometer in the beaker and turn it on.
4. Crumple up the 2 g. sheet of aluminum foil into a loose ball.
5. Place the ball of aluminum foil into the beaker with the copper chloride. **Keep the thermometer submerged in the liquid.** You may push the aluminum with the stirring rod if you want.
6. Record the temperature of the contents of the beaker every 10 seconds for 3 minutes.
7. Dump the contents of the beaker into the sink and rinse it thoroughly. Return the beaker to the front table.
8. Repeat steps 2-7 replacing the aluminum with steel wool.
9. Graph your data as stated in the direction on the next page.

Your Progress:

- Mastery
- Proficient
- Developing
- Beginning

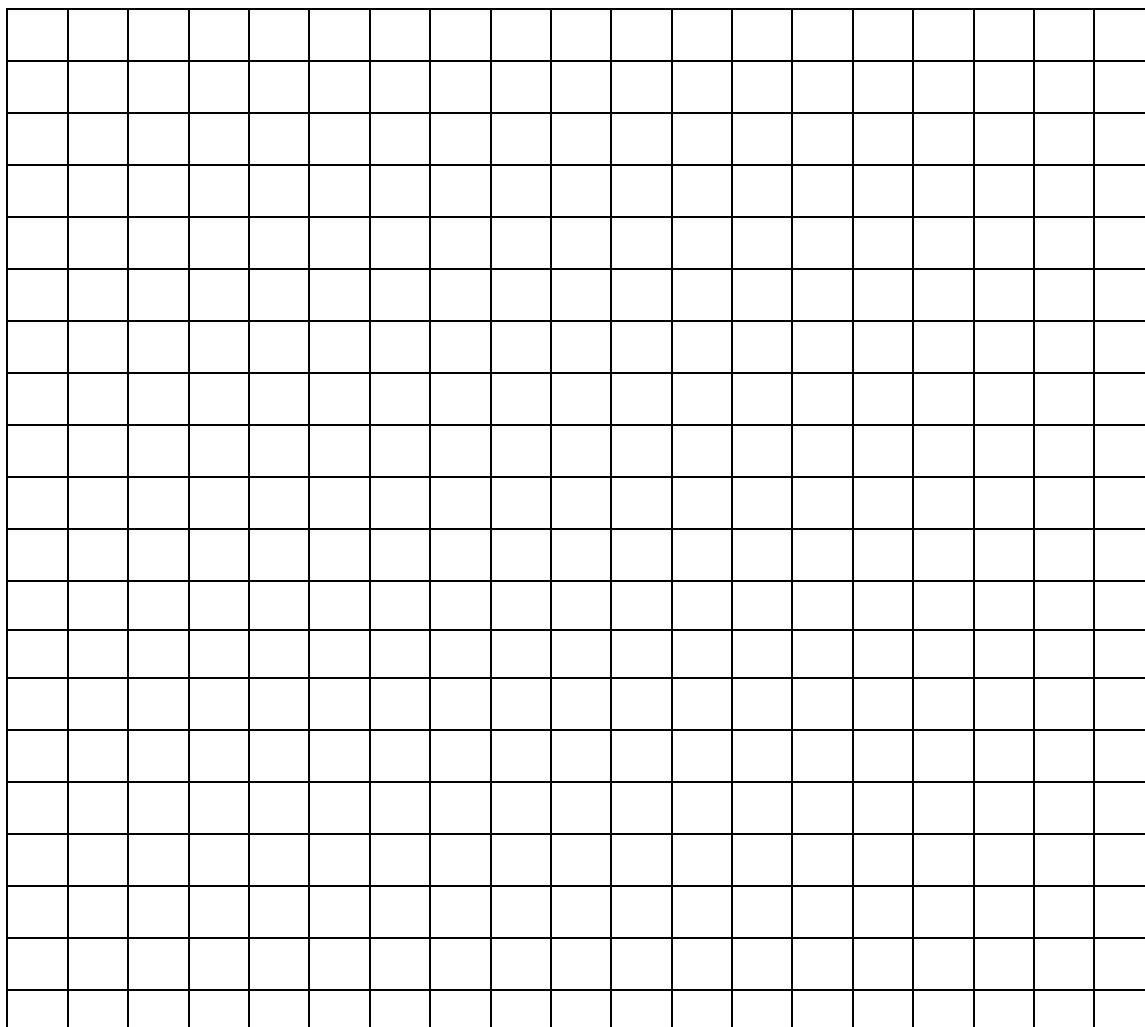
Data

Time	Aluminum + Copper Chloride Temperature (°C)	Steel Wool + Copper Chloride Temperature (°C)
(Starting Temperature)		
0:10		
0:20		
0:30		
0:40		
0:50		
1:00		
1:10		
1:20		
1:30		
1:40		
1:50		
2:00		
2:10		
2:20		
2:30		
2:40		
2:50		
3:00		

Graph

Create a line graph of temperature (y-axis) versus time (x-axis). There should be 2 differ colored lines to represent the 2 metals added to the copper chloride.

Title: _____



Conclusion

Which combination of metal and copper chloride produces greatest thermal energy?

Notice the temperature peaks and then drops. Why is the thermal energy no longer produced?
