

Classroom Chemistry – Colourful Elements

Ever noticed how a colourful ad in the newspaper will give off coloured flames when you throw it in a fire? Did you know that when you look at coloured fireworks you are looking at coloured flames? This experiment will use this property of elements to make colourful flames.



Materials:

- Popsicle sticks
- Boric acid (drug store item)
- Cream of tartar
- Flame source (BBQ lighter)
- Cup of water

Procedure: (Remember to have your parent's permission and have them watch and help you.)

- Dip the popsicle stick in water.
- Dip the wet popsicle stick into the boric acid.
- Dim the lights and place the boric acid-covered popsicle stick into a flame. What color does the flame produce?
- Dip another popsicle stick in water.
- Cover the wet popsicle stick with cream of tartar.
- Again, dim the lights and place the tartar-covered popsicle into a flame. What color does the tartar flame produce?

What's Happening:

The experiment that you just conducted is called a flame test. A flame test is used to detect certain elements in a material. When you stick the boric acid in the flame, you get a bright green flame. This indicates the presence of the element Boron. The cream of tartar should give a purple flame, the color associated with potassium. These element-specific colors, that is their characteristic emission spectrum, is the colour given off when the atoms in an element's electrons jump from a high energy state to a low energy state and gives off energy in the form of light that we can see.

Extension:

You can make your summer bonfire a colourful one by creating your own special pinecones. Make a concentrated solution of boric acid and hot water. Collect old dried out pine cones and soak them in this solution. Dry them out and then add them to your next bonfire. You can achieve different colours using other chemicals but some, like copper sulphate (common name: blue stone), can be an irritant if ingested. A rainbow of "flame" colour sources may be found here: <http://chemistry.about.com/od/coloredfire/a/Rainbow-Of-Colored-Flames.htm> (also Epsom salts will give a white flame). Note: Don't mix the chemical solutions. Keep them separate as you will usually only see yellow. This colour tends to dominate the others. And remember to never cook your hotdog or roast your marshmallows over a coloured flame as you don't want the food to become contaminated with the chemicals.

This activity is based on our Classroom Chemistry kit. The source for this lab is <http://www.stevespanglerscience.com/lab/experiments/flame-test>. Our teaching kits (described on our website) are loaned out FREE to provide classroom teachers and parents of home schooled children an opportunity to explore Science in interesting ways. Please consider volunteering as a classroom guest speaker or offer your business as a field trip location.

Lorne Cooper, Regional Executive Director

PRAXIS, "Making Science Fun". Contact Praxis at praxis@praxismh.ca, www.praxismh.ca, Tweet or follow us @PraxisMedHat, or friend us on Facebook. Address: c/o 200 7th Street S.W., Medicine Hat, AB, T1A 4K1 Phone: 403-527-5365, Fax: 403-527-6570.