

# Flame Tests

What do the street lamps, salt, and fireworks have in common?



They all contain sodium which gives off a unique **orange** flame when heated.

You are going to find out what color six different known metal solutions make. You will then use your results to work out which metals are in two unknown samples.

## Materials:

Aprons, goggles, gloves

HCl- highly corrosive and toxic, use gloves

$\text{CuSO}_4$

$\text{KNO}_3$

$\text{CaCO}_3$

$\text{BaCl}_2$

$\text{Pb}(\text{NO}_3)_2$

$\text{NaCl}$

Metal loop

Microplate

Small beaker

Test tube

## Procedure

1. Draw the table below in your lab notebook for your results.
2. Fill a test tube 1/2 full with 5M HCl and place the tube in the small beaker. This is your cleaning solution. Make sure that you have a clean flame test wire. Do this by holding the metal loop in the hottest part of the burner flame. If it is clean, there should be no change in the

color of the flame when the metal loop is put in the flame. If the metal loop is not clean, clean it by dipping it into the concentrated acid provided and holding the loop in the burner flame.

3. Repeat this cleaning until there is no more change in the color of the flame.
4. The next job is to do your flame tests. With the dropper, place each of the six solutions in a separate well of the microplate (fill each well  $\frac{3}{4}$  full.) Use the order of the table below. Dip the flame test loop into the NaCl, then hold the metal loop in the hottest part of the burner flame. Make a note of the color of the flame in the table in the table in your notebook.
5. Clean the flame test wire as you did in Step 2, then test another known test solution. Keep going until you have recorded the color of all of the known solutions.
6. Repeat Step 4, but this time with the two unknown test solutions. Record the compound and color in the table in your notebook.

Copy this table into your Data section:

Substance	Color
NaCl	
CuSO <sub>4</sub>	
KNO <sub>3</sub>	
CaCO <sub>3</sub>	
Pb(NO <sub>3</sub> ) <sub>2</sub>	
Unknown #1	Identity:
Unknown #2	Identity: