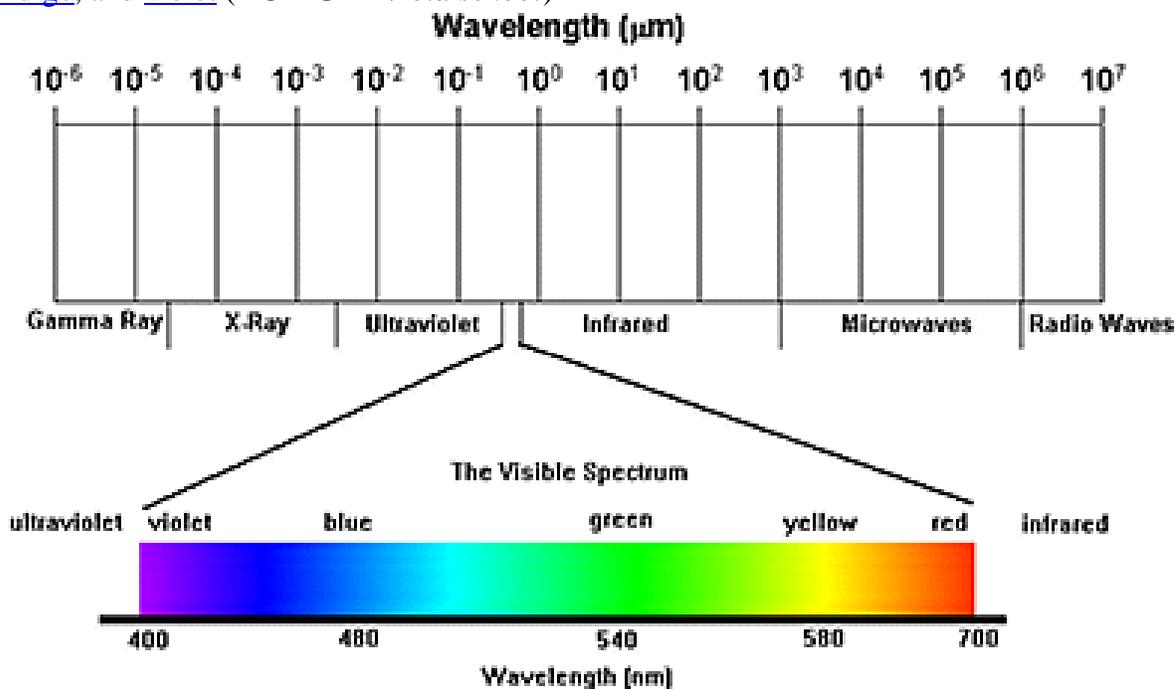


(Kit by [Neo Sci](http://www.neosci.com) #20-1693 Cost \$127.98 @www.neosci.com)

The use of experimental kits can assist a teacher in explaining certain concepts. The use of flame spectroscopy has its roots in medieval alchemy. Why are fireworks different colors? Let's find out!

As a result of differing numbers of protons in each element the electron configuration of each atom differs in the number and location of its electrons. It turns out that if you excite an atom, for instance applying heat, the electrons move up to higher energy levels. (Quantum Number) As the energy dissipates these electrons radiate energy returning to their ground state. As nature would have it some of these energy changes produce specific visible light.

Newton divided the spectrum into seven named colors: [red](#), [orange](#), [yellow](#), [green](#), [blue](#), [indigo](#), and [violet](#) (ROY G BIV *old school*)



Source of above visual ([http://www.daviddarling.info/encyclopedia/V/visible\\_light.html](http://www.daviddarling.info/encyclopedia/V/visible_light.html)) 8/01/2009

**The stated kit objectives:**

- Observe and record the colors emitted by metallic elements upon heating
- Relate the results to known standards to identify unknown samples
- Learn about the electronic structure of an atom
- Explore the relationship between color and energy in the electronic spectrum

The paperwork that comes with the kit can be used right out of the box.

A phone number is provided for questions and support. The kit contains “homemade” spectrometers which can be used by more mature students. They do work and the spectra lines are visible. I would recommend spending the extra money for commercially available spectrometers which provide actual wave length scales.

The kit uses metal chlorides ( $\text{CaCl}_2$ ,  $\text{LiCl}$ ,  $\text{KCl}$ ,  $\text{NaCl}$ , and  $\text{SrCl}_2$ ) to produce the various spectra. No mention is made of the production of chloride gas (toxic) during the exercise. If ventilation is available it should be used. Normal safety precautions should be exercised. (Gloves, Goggles, Apron) I have seen this done with solutions containing the salts. In this experiment the chemicals adhere to the nichrome wire loops by dipping in distilled water and then into the crystalline salts prior to putting into flame. To adequately see the spectra decrease light intensity as much as you feel safe with, or is possible. Having different types of lights also produces varying spectral lines. An incandescent will provide you with a continuous spectra, as does the Sun without blinding the students. Florescent will produce a mercury spectrum; think about why these lights are not as green as you have been told. Sodium lights are common for many parking lots with their distinctive orange color. Neon lights containing various gasses and coatings are another great source. Got some LED's give them a try!

I will leave you with some thoughts from other teachers concerning this laboratory kit:

“This would be a good lab for chemistry students. I will most likely transfer this into a Demo Lab for my Integrated Chem/Physics class.” Rich

“I would think this kit would be excellent for a chemistry teacher looking to save time. Rather than have to collect flame test material, everything is right there. Also, the kit would complement a qualitative analysis lab.” Bryan

“While I can see and appreciate the value of this lab, I am wary of the frustration level some students may encounter. Some results were very difficult to distinguish...but if you can eliminate most all outside light sources, it might yield better results.” Teri

“This is a good lab for setting up an unknown lab based on different chemical 'known tests'. I would eliminate the spectrometers though unless you have good ones and just concern yourself with the actual flames. Other chemicals that have good flame colors are barium chloride, and copper( I think, II ) sulfates. Fun lab. When we have eighth grade visitation days, we use this one when they sit in on a chemistry class. They love that they get to wear goggles and play with fire.” Deb

For additional information or your comments visit  
<http://peterka.wikispaces.com/RET+2009+Molecular+Bio>.