Physical Science | Flame Test Lab | Date

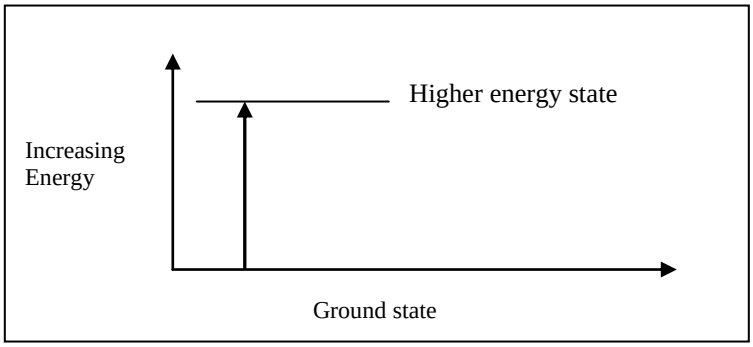
Period

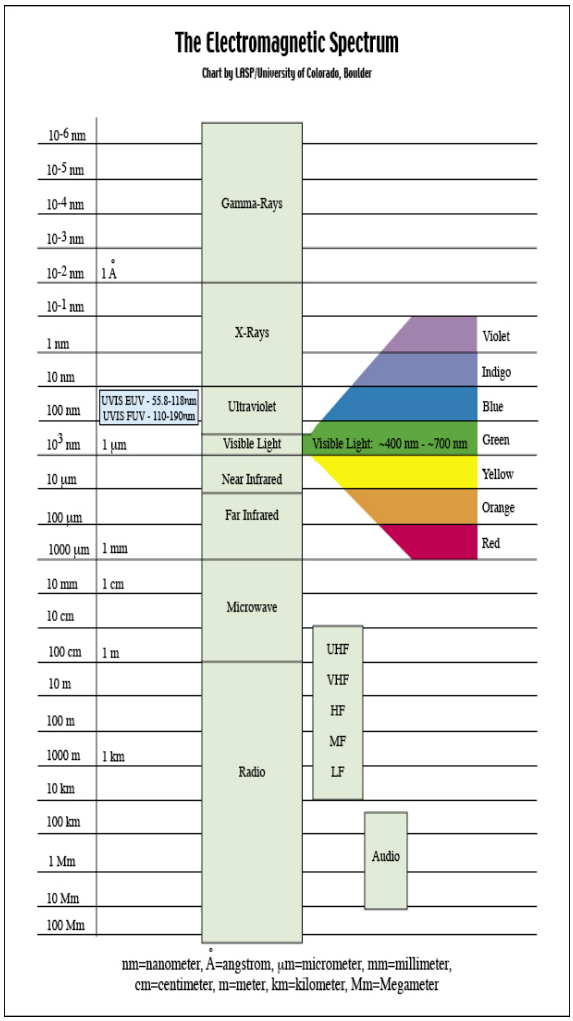
KJHS | Name

Introduction: Just as a fingerprint is unique to each person, the _____ ___ _____ emitted by metals heated in a flame is unique to each metal. When a substance is heated in a flame, the electrons absorb energy and jump to a higher energy level (electron shell). Naturally, they want to relax back down to the "ground" state (original electron shell). When an electron transitions from a higher energy level to a lower energy level, a particle of light called a _____ is emitted. (represented by a squiggly line).

Photon : _____

_____





Wavelengths are listed in nanometers ($1X10^{-9}$ m). Because each element has a different electron configuration, its wavelength and color are unique to each substance.

Electromagnetic Spectrum:

Visible light is a form of electromagnetic radiation. Other forms of electromagnetic radiation are: gamma rays, x-rays, ultraviolet, infrared (heat), microwave, radar, and radio waves. Together, all of these make up the electromagnetic spectrum.

The visible portion of the EM spectrum is only a small part (___%) : 400 nm → 700 nm.

400 nm = _____

700 nm = _____

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As the color of the light changes, so does the amount of energy it possesses.

Materials: Calcium Chloride _____ Cupric Chloride _____
Lithium Chloride _____ Potassium Chloride _____
Sodium Chloride _____ Strontium Chloride _____
Distilled water, 250 ml (2) 250-ml beakers (6) test tubes (6) wooden splints
Bunsen burner

Procedures:

1. Fill a 250-ml HALF FULL with distilled water.
2. Get 6 wooden splints, and 6 test tubes (1g).
3. Fill a second 250-ml beaker HALF FULL with tap water. (Labelled "rinse water").
4. Light your Bunsen burner.
5. Dip the soaked end of one of the wooden splints in one of the metallic salts, then place it in the flame.
6. Observe the color of the flame. Allow the splint to burn until the color fades. Try not to allow any of the solid to fall into the barrel of the Bunsen burner.
7. Immerse the wooden splint in the "rinse water" to fully extinguish it, then discard the splints in the trash when the lab is complete.
8. Record your observations for the flame color produced by the metallic salts in the data table.
9. Repeat steps 5-8 for the other five metallic salts.

Metal	Predicted color	Actual Color	Group #	Period #

Conclusion:

1. Which metal produced the most amazing color? _____
2. Where might you see a real flame test occur on a larger scale? _____

CHROMEBOOK RESEARCH: The "Northern Lights" or an "Aurora" happen because specific elements and their electrons in the ionosphere (a layer high in the atmosphere) get "excited" and produce beautiful colors in the night sky.

3. Where can these "lights" be seen? _____
4. What is the source (what causes) an Aurora (why do these elements get 'excited'?
   _____
5. Can you list 2 – 3 specific elements that are in Earth's ionosphere (which ones produce the lights) and can you find out which elements produce a certain color? *** (extra credit 1 pt)
   _____