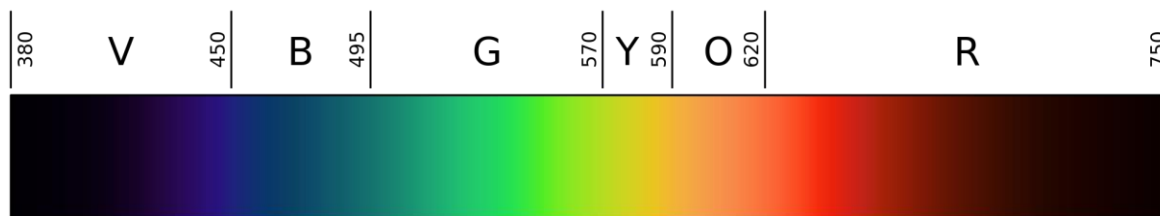


Chemistry Lecture # 24: Demonstration of Emission Spectra

Substances will emit colors if they are given energy. The pattern of colors they emit is called the emission spectra.

Substances can be given energy by heating, or by passing an electric current through the substance.

Often times, a substance that is heated will produce a continuous spectrum. A continuous spectrum is simply all the colors of the rainbow and all the different shades of colors that can be produced. Below is picture of a continuous spectrum.

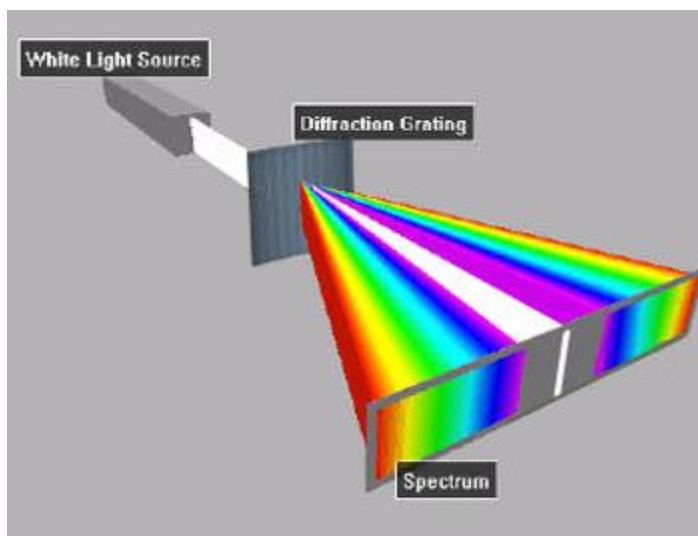


The sun and incandescent light bulbs can produce a continuous spectrum.

We can see the continuous spectrum produced by the sun or an incandescent bulb by using a diffraction grating. A diffraction grating is a piece of clear glass or plastic that has slits cut into it. The slits are very close together. They could be as close as 0.00006 inches apart!

A diffraction grating acts like a prism: it separates white light into its component colors. Thus, a diffraction grating can be used to separate the colors emitted by a substance, allowing us to see the continuous spectrum of colors emitted by some objects such as the sun.

Below is a diagram of a diffraction grating separating light into its component colors.



A diffraction grating can also be used to see the emission spectrum of elements or compounds. Different substances emit different patterns of colors. Thus, we can match the emission spectrum of an unknown substance to the spectrum of known substances to establish its identity.

Fluorescent light bulbs of different colors contain different substances. Thus, each type of bulb emits its own unique pattern of colors.