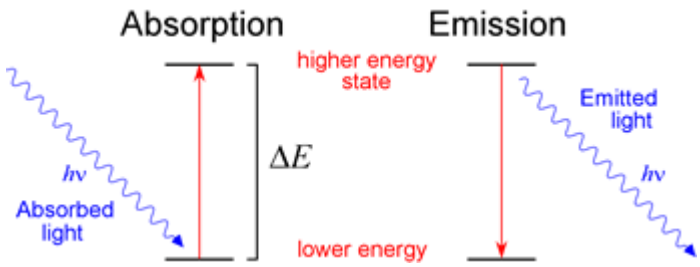
Notes- Chem 1
Concepts needed for the Color Lab

Name_____
Period_____ Date_____



When an electron **absorbs light**, the electron is excited into a higher energy level.

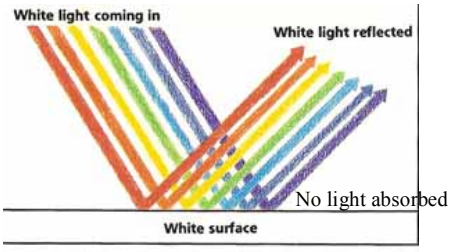
When an electron relaxes down to a lower energy level, **light is emitted.**

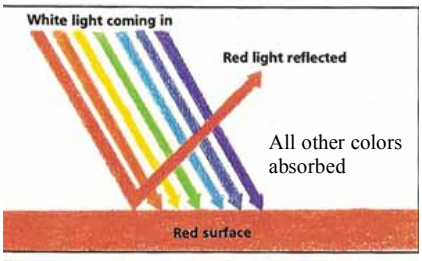
Emission Spectra: This type of spectra is obtained when an electron absorbs some form of energy (electricity, heat, or EM radiation) and is excited into a higher energy level. Then, when the electron relaxes back down to a lower energy state, **light is emitted.** Common examples of emission are…

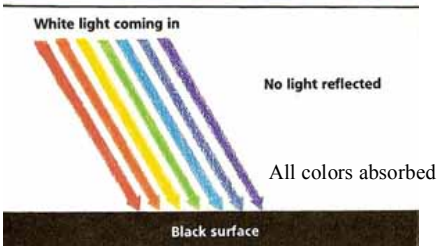
a) Gas Discharge tubes: Electricity is sent through a gas, light is emitted
b) Flame tests: Substances are heated in flame, light is emitted
c) Fluorescence/Phosphorescence: Light (often uv light) is absorbed by substance, lower energy light (often visible) is emitted.

Absorption Spectra: This type of spectrum is obtained when some wavelengths of **light are absorbed** by a substance. (The absorption of light occurs because an electron absorbs a wavelength of light and is excited into a higher energy level.)

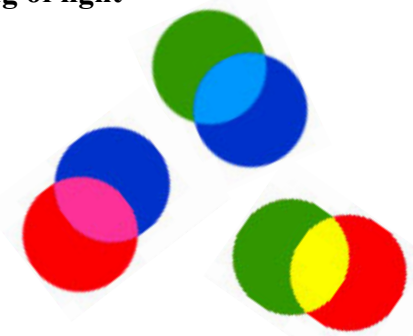
a) Absorption of light can occur when light shines on an object. Often the object only absorbs some wavelengths of light. The wavelengths that are not absorbed are reflected back. The blended reflected light is the color that we "see". (Our eyes can only see reflected **visible** light, but one could use a spectrometer to detect other wavelengths of light.)

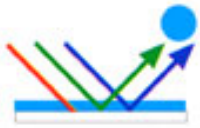






Additive Mixing of light



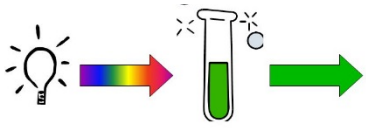


Red absorbed; Blue + Green make cyan

G absorbed; R + B make magenta

B absorbed; R + G make yellow

b) Light can also be absorbed by a solution. The wavelengths of light that are not absorbed are transmitted through the solution. The blended transmitted wavelengths give the color of the solution.



What should be the color of the Cu^{2+} solution?

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Absorption Spectrum of a Cu^{2+} solution