

Introduction to X-ray Diffraction (XRD)

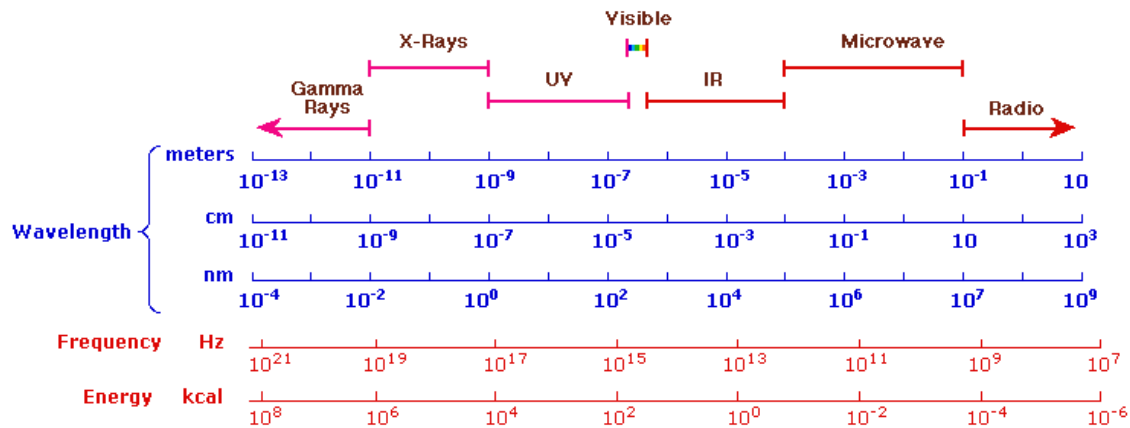
Learning Activity

Basic Theory: X-rays

What are X-rays?

X-rays are electromagnetic radiation with very *short* wavelengths and *high* energy.

The Electromagnetic Spectrum

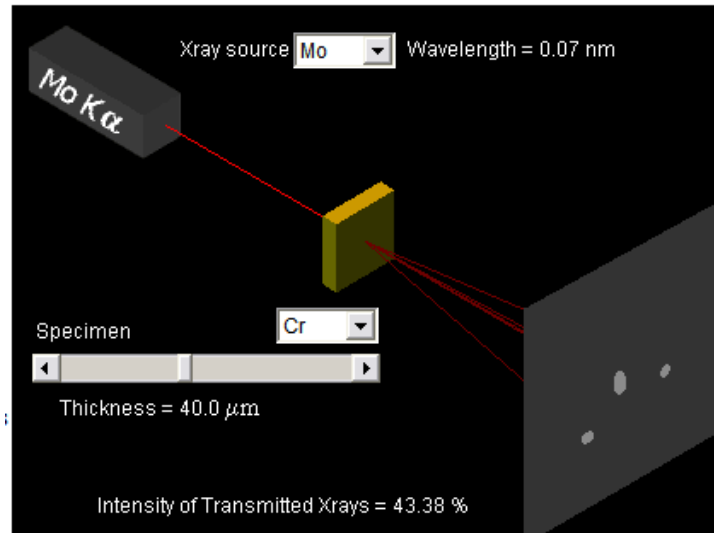


X-rays have high energy and they penetrate opaque material, but are absorbed by materials containing heavy elements. As an x-ray beam travels through a substance its intensity decreases with distance traveled through the matter.

Question:

1. Is water or Cr a better absorber of X-rays?
2. What effect does the wavelength of the X-ray sources have on penetration of X-rays?

Try the following demonstration [here](#) to help in answering these questions:



In addition to adsorption, X-rays can also be **scattered** and **diffracted** by a material.

Question:

1. What do you think makes something scatter vs. diffract?

Let's take a look at the next section on Diffraction.