3.091 Solid State Chemistry: Week 9

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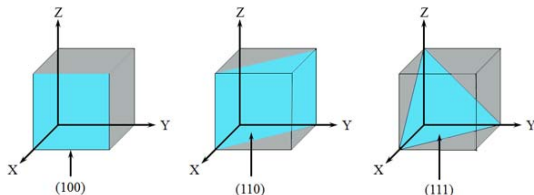
Progress Update

Over the past week I have been introduced to:

1. Crystal planes and Miller Indices
2. Bragg's Law
3. Mechanical Behavior of Solids

Crystal planes

There exists a naming system to identify what plane through a crystal is being considered, that refers to what are called *Miller Indices*. Consider the following planes in a cubic crystal:

(100)   (110)   (111)

The value in parentheses refers to the numbers achieved through the following steps:

1. Minimize the distance between the origin and the plane, without allowing any line of the plane to lie entirely on an axis.

2. Find the x, y, z intercepts.

3. Reciprocate and multiply all by the GCD.

Bragg's Law

Bragg's law states that if the following equation

$$2d_{hkl}\sin(\theta) = n\lambda \text{ where } n \in \mathbb{Z}$$

is satisfied by the system
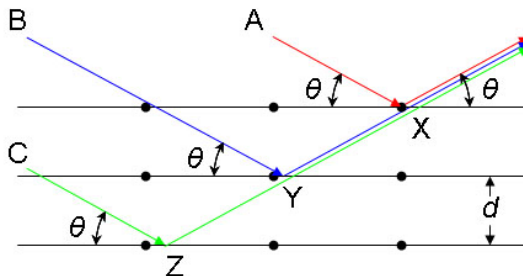
then the incoming radiation of wavelength λ is diffracted by the crystal.