Tutorial 1
X Ray Diffraction

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June 9, 2017

Date Performed:	June 7, 2017
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1 Objective

To get to know the diffractometer and X'Pert Data Collector

2 Results and Conclusions

Increasing the width of the slits generally increases the intensity because more photons can get through. If you decrease the size of the anti-scatter slit you reduce the background signal so the peaks get smoother but also less intense. The accepted wavelengths for $K\alpha_1$ and $K\alpha_2$ are .1540562 and .1544398 nm, respectively.
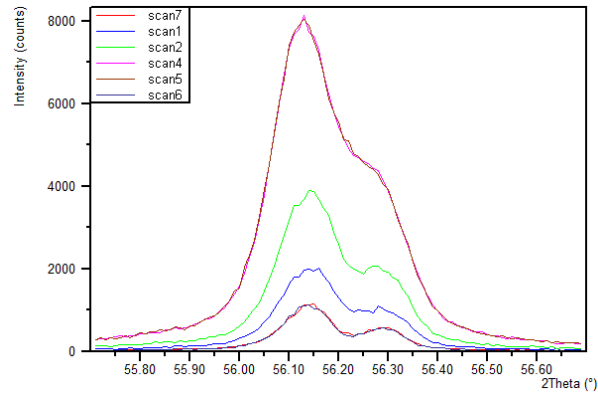

Figure 1: Si sample with Cu target: $K\alpha_1$ and $K\alpha_2$ peaks

3 Discussion

$CuK_\alpha 1$ is about twice the intensity of $CuK_\alpha 2$ because the transition for the first one

4 Answers to Definitions

a. The *atomic weight of an element* is the relative weight of one of its atoms compared to C-12 with a weight of 12.0000000..., hydrogen with a weight of 1.008, to oxygen with a weight of 16.00. Atomic weight is also the average weight of all the atoms of that element as they occur in nature.

b. The *units of atomic weight* are two-fold, with an identical numerical value. They are g/mole of atoms (or just g/mol) or amu/atom.

c. *Percentage discrepancy* between an accepted (literature) value and an experimental value is

$$\frac{\text{experimental result} - \text{accepted result}}{\text{accepted result}}$$