Introduction to Reciprocal Space
Assignment 1

1) The wavelength of Cu Kα X-ray beam used in a laboratory experiment is approximately 1.5406 Å, while that of an electron beam of a transmission electron microscope, operated at a specific voltage is 0.02 Å. Assuming both of them are used to examine a single crystal Pt sample, what are the major differences that one can expect in the data obtained. Discuss in terms of condition for diffraction in reciprocal space.

(5 Marks)

2) An XRD experiment uses an X-ray generator that has filters to ensure that a single wavelength of radiation is incident on the sample. Supposing the filters are removed, how will the experiment change, and how will the data obtained change. Explain in terms of the Ewald sphere in reciprocal space

(5 Marks)