MATE 318

Spring 2025

Homework # 4

Due: May 2nd, 2025

Group submission (up to 3 students per group) is allowed.

Question:

A commercially pure piece of copper is cold worked and then its x-ray diffraction pattern is obtained using monochromatic Cu Kα (λ = 0.1542 nm) x-rays. The same sample is then given an annealing treatment and its x-ray diffraction pattern is obtained again.

Using the diffraction data of the cold worked (*Coldworked_Cu.txt*) and annealed (*Annealed_Cu.txt*) samples, <u>determine the strain and crystallite size</u> for the cold worked Cu.

Assume:
1) $B_{exp} = B_{size} + B_{strain} + B_{inst}$
2) The annealed sample is strain free and has a very large grain size so that the only source of broadening for this sample is the instrumental broadening.
3) There is no texture in the samples.