

Summary of Heat Treatment Processes

Updated 13 October, 2011

	Physical mechanism/process	Effect on structure	Effect on properties	Pictorial Representaiton
Cold work (required before heat treatment)				
Recovery				
Recrystallization				
Grain growth				

Some interesting thoughts to ponder

Crystals are like people – it's their defects that make them interesting!

In many ways, a crystal with a huge number of defects will actually behave more like a perfect crystal more than one with only a few defects.

A decreased grain size will cause an increased strength *and* toughness in many metals. Why?

The value of the diffusion coefficient, D_0 , for an atom diffusing in through a host material depends on where the atom is located (higher for surfaces/interfaces, lower if it is part of a dislocation, lowest in the bulk crystal).

Review/Exam info

Office hours today will be right above the screw-dislocation-like staircase in the CSE atrium (at the comfy sofas).

Dr. Wynarsky's review session will be at 8pm tonight.

Try to arrive at 9:30am on Friday morning; we will try to start earlier than 9:40 if people all show up and settle down.

Adams -> Salemi in 1504 GG Brown (our classroom). Salka -> Zhou in 2150 Dow. 6 pages total. 3 pages of multiple choice. A few explanation/mini-essay type questions. (Obviously) a slip system question. Interpreting a stress-strain graph. Equations for elastic deformation. Maybe a cold work / partial diameter question. Bonding energy diagram question. Concept-focused, not many calculations.