Material science- Exp.2

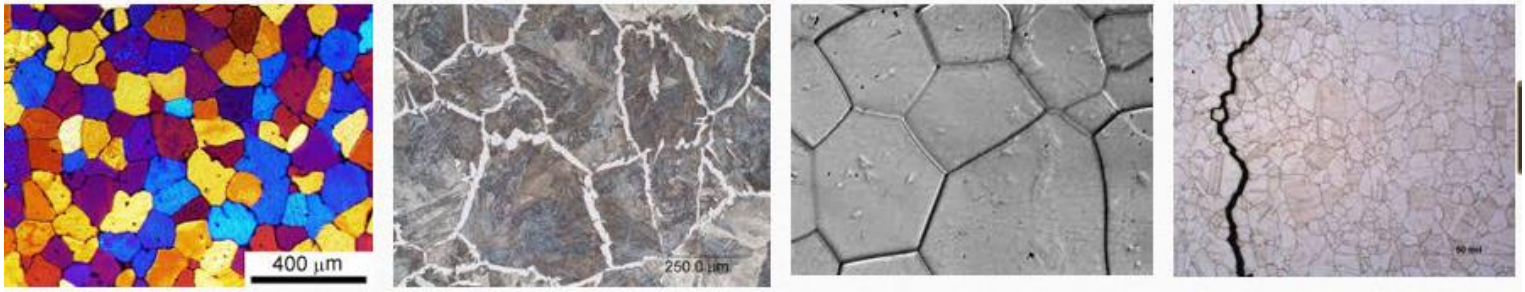
Metallography

Presented by professor

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METALLOGRAPHY / MATERIALOGRAPHY SIX STEPS FOR AN INFORMATIVE SAMPLE

The task of metallography i.e. materialography is to ascertain the structure of the material by means of macro & microscopic procedures. Even metals display a crystalline structure- in the same manner as non-metallic crystals such as the quartz rock crystal among others –whose features can be ascertained qualitatively and quantitatively



1- Cut-off

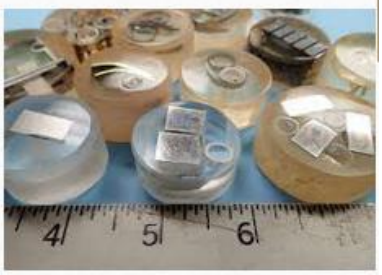
Step number one involves cutting off a section to be tested/examined as a sample of the material by means of a cut-off machine and the corresponding clamping tools which have been designed to clamp at strategic positions



2- Mounting

Small-sized samples on the other hand, have to be mounted initially to improve handling and/or protection for the edges, which takes place using either cold or hot mounting procedures. In the case of the latter, the samples are mounted in a so-called mounting press- here referred to as the hot mounting press. In the course of this process, the sample is surrounded by special plastic granulate (diverse thermoplastics), which is then pressed together using heat and hydraulic pressure. Using this method means that the material is fully enclosed in plastic and is therefore optimally ready for the next metallographic preparation step.



3- Grinding and 4- Polishing

In order to make the crystal structure visible, the sample surface must be initially ground even with silicon carbide papers, and then polished.

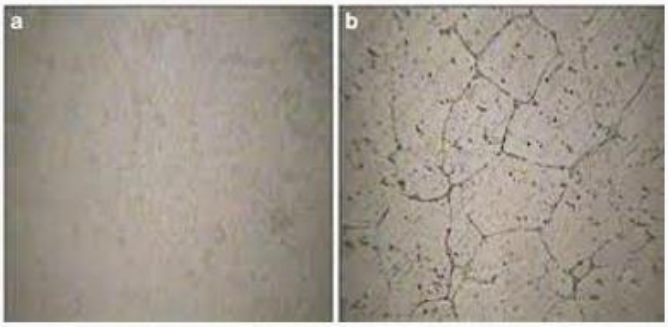







5 - Etching

After completion of the last polishing step. In order to make the crystal structure visible for being contrasted, the sample has to undergo a further preparation step either manually per immersion into an etching liquid .The particular etching fluid for the particular sample has the effect of changing the reflexion behavior of the integral crystalline component so that an optical difference is possible. Following etching, the sample is washed in alcohol and then rapidly & thoroughly dried under a flow of warm air.







6- Using the Microscope and evaluation

You are requested to:

A- Watch" metallography part I" and "metallography part II" on YouTube channel

B- Write a report of five pages about metallography