Experiment no.1

Metallographic Microscope

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Metallography is finding out about the structure of metals. Nowadays however, the description "Materialography" is preferred due to the increasing number of composite matter such as the development of additional materials (ceramic/metallic systems, metallic/plastic systems, etc.). Deployment areas of metallography i.e. materialography lie mainly in quality control and damage analysis as well as in R & D.

METALLOGRAPHY / MATERIALOGRAPHYSIX 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.

3- Grinding and Polishing

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

4- 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.

5- Using the Microscope and evaluation

If the crystalline structure contrasts correctly in this manner, then the sample can be evaluated. Through making use of observation under the macro or microscope as well as evaluation per modern picture analysis & image archiving programs, a string of statements about such as state of heat treatment, welded seams, crystalline structure and the quality of materials can be made. Furthermore, quite often metallography allows conclusions to be drawn from the manufacturing process and/or causes of failure in cases of damage.

What is a metallographic microscope?

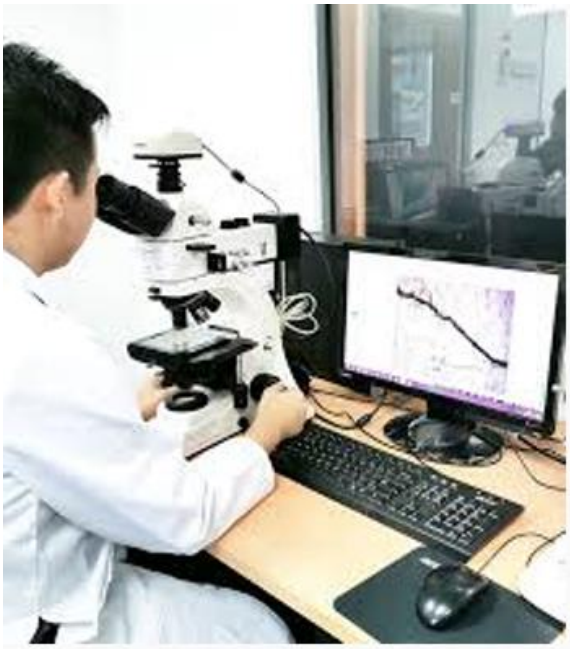
Metallographic microscopes are used to identify defects in metal surfaces, to determine the crystal grain boundaries in metal alloys. This type of microscope employs vertical illumination, in which the light source is inserted into the microscope tube

How does a metallographic microscope work?

Metallurgical microscopes (also known as materials microscopes) are equipped with an incident light source (also called reflected) which sends the light through the objective onto the reflective surface of the metal.

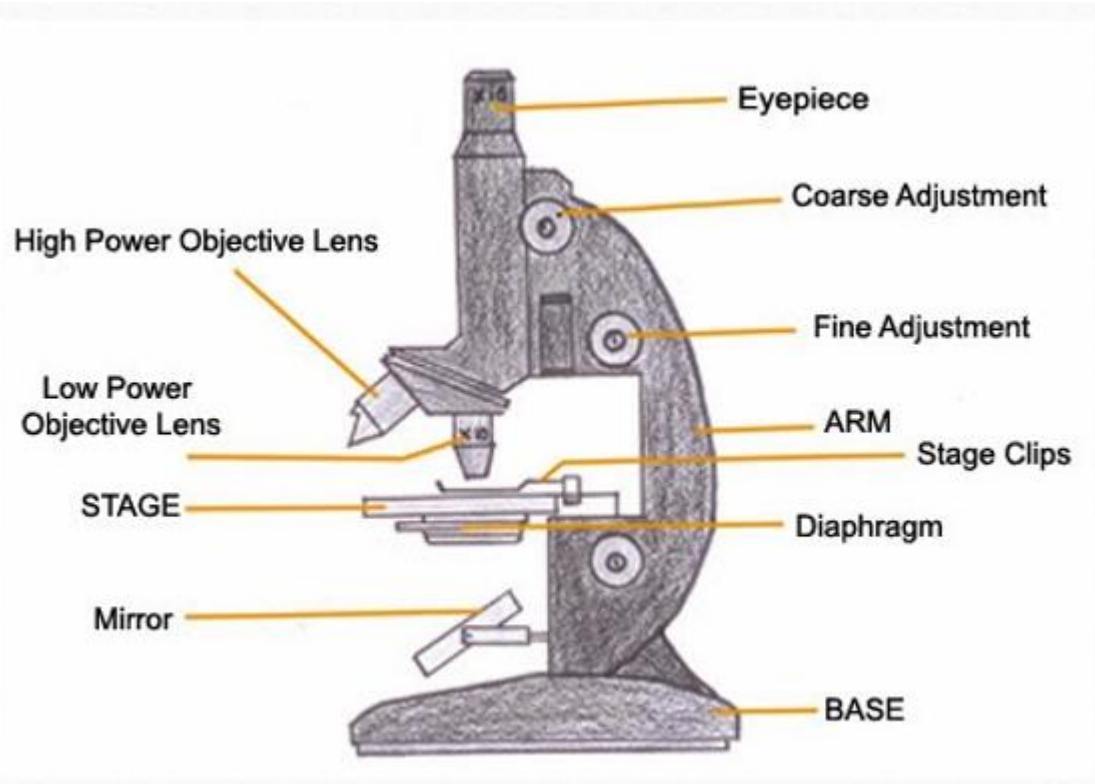
https://www.metallographic.com/Movie/Video-IM-5000.html

https://www.google.com/search?q=metallographic+microscope+features&sca_esv=572214004&biw=1366&bih=651&tbm=vid&ei=aIolZafMCeqG9u8PouKRwAM&oq=Metallographic+








Eyepiece
Coarse Adjustment
High Power Objective Lens
Fine Adjustment
Low Power
Objective Lens
ARM
Stage Clips
STAGE
Diaphragm
Mirror
BASE





Experimental requirement

Each group write a report of 5 pages about metallographic microscope and presents it by using power point technique