ChE 891/2

Experimental Methods in Nanotechnology

Homework 3
Due 28 Jan 2008

1. Find in a paper, in an archival journal, SEM images that are:

- Technically (an image that was challenging to obtain)
- Scientifically (an image that was critical to the manuscript)
- Artistically (an image that looks interesting)

impressive. Cut and paste the images in your homework.

2. Which types of analysis can be done by SEM besides mapping out the surface topology. Briefly explain each analysis technique.

3. Find the typical working distance and aperture diameter in an SEM from an archival journal or book. Re-derive the relation for the depth of field in an SEM as a function of these two variables. Determine, through archival journals or books, what is the maximum magnification for a typical SEM. What variables determine this magnification. Then using the typical working distance, aperture diameter and maximum magnification determine the depth of field under these conditions.

4. Explain in detail what X-ray fluorescence is, what similar process occurs in the SEM?

Please give the references to any archival journal or book in your homework solution.