



Electron Spectroscopic Imaging (ESI)

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In standard transmission electron microscopy the image is formed from the entire range of electron energies transmitted through the sample including those electrons that were scattered elastically (zero-loss) and those electrons that were scattered inelastically (energy loss). In energy filtered imaging the image is formed only by electrons transmitted within a certain energy window. Energy filtered imaging can be used to obtain specific elemental information and also to improve the resolution of the microscope.

Possible Applications

- elemental distributions in heterogeneous catalysts
- grain boundary segregation in intermetallic alloys
- detection of impurities at ceramic interfaces
- resolution improvement in thick samples (remove plasmon-scattered electrons)

Limitations

Sample must be thin enough (typically, less than 50-100 nm) to avoid plural inelastic scattering. Background subtraction required for quantitative distributions.

Source: <http://www.asu.edu/clas/csss/chrem/Techniques.html>