Environmental cell microscopy uses differential pumping and small apertures to maintain a controlled atmosphere environment in the region of the sample, thereby enabling chemical reactions to be studied in real time at close to atomic resolution.

Possible Applications

- real-time imaging of gas-solid reaction kinetics
- real-time study of compositional changes using EELS
- energy-filtered images (chemical maps) of reacted and unreacted areas

Specimen Requirements

Samples can be prepared by almost any method (crushing, chemical thinning, ion-beam milling) but must be thin (< 50nm) for high-resolution viewing.

Limitations

Image resolution will deteriorate seriously as the ambient pressure is increased above about 10 Torr. Specimen temperature range restricted during use of corrosive or oxidizing gases.

Suitable Microscopes

This technique is available on the following instrument:

- Tecnai F20

References