

Analytical Transmission Electron

Description of facility

The analytical transmission electron microscope is used to study microstructural features on a submicron to nanometre scale. Typical examples are concentration profiles of high spatial resolution, detection of grain boundary phases and segregations, evidence of orientation relationships between adjacent phases, and analyses of dislocations.

The analytical transmission electron microscope combines three modes of high-resolution materials characterization, i.e. imaging, spectroscopy (X-ray spectroscopy, electron energy loss spectroscopy), and diffraction (selected area diffraction, convergent beam diffraction). Thus, transmission electron microscopy is a most powerful tool for materials and solid state science.

Equipment:

- Schottky field emission gun
- "Super-twin" objective lens
- Scanning unit (STEM), bright field, dark field, and HAADF detector (Fischione)
- EDS system (EDAX)
- Imaging filter GIF 2002(Gatan)
- CCD camera MSC 794 (Gatan)
- Analytical sample holders, hot stage sample holder, cold stage sample holder
- Plasma sample cleaner (Fischione)

Application

- Study of microstructural features on a submicron to nanometre scale
- Modes of high-resolution materials characterization, i.e. imaging, spectroscopy (X-ray spectroscopy, electron energy loss spectroscopy), and diffraction (selected area diffraction, convergent beam

diffraction).

Contact

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This handout, and cross-references to related measurement techniques and facilities are available at: <http://messtec.dlr.de/link-260-en>.

HAADF-image of TiAl EDX-Mappings

