Scanning Electron Microscopy and EDX microstructure analysis

Fig. 1: SEM schematic

Fig. 2: BSE image showing element contrast for different atomic mass on a cross section

Fig. 3: SE image highlighting the surface structure of a sample

Fig. 4: Schematic energy dispersive spectrometer

The energy dispersive spectrum is generated by X-Rays leaving the excitation volume of the sample, absorbed by the Si(Li)-Detector.

The Spectrum is used for qualitative and quantitative analysis of the sample

Fig. 5: Energy dispersive spectrum

Nanoindentation

Berkovich indenter

\[ \theta = 65.27^\circ \]

\[ A = 3\sqrt{3} \times h_c^2 \times \tan^2\theta = 24.5 \times h_c^2 \]

\[ H = \frac{P}{A} = \frac{P}{24.5 \times h_c^2} \]

Precise point indentations to correlate the hardness with O-concentration in a pre-oxidized \( \alpha_2 \)-Ti<sub>3</sub>Al sample

Correlation of reduced modulus with Al-concentration for aluminide coatings after thermocyclic oxidation

The reduced modulus is approx. 500 \( \mu \)m from the subscale zone (approx. 500 \( \mu \)m from the surface) post isothermal exposure at 900°C for 100h in lab. air.