Appendix Figure 2

TEM images
overview

examples of tight grain boundaries

Ttn2 (7d) rutile (rt) - titanite interface: closed grain boundary (TEM foil # 1931)

Appendix Figure 1; page 1; Ttn 2
Ttn2 (7d) rutile (rt) - titanite interface: open grain boundary with amorphous phase and pores (TEM foil #1927)

Overview

Diffraction contrast patterns end at the grain boundary that is filled with an amorphous phase containing pores (plasmon image).

Element spectrum of area 1 in the amorphous phase at the titanite - rutile interface. A spectrum of titanite from the same sample is shown for comparison.

Appendix Figure 2; page 2; Ttn2
Diffraction contrast patterns end at the grain boundaries. The interface is filled with an amorphous phase that contains pores (bubbles).

below: upper panel shows element spectra of the amorphous phase (1) and titanite (2); lower panel shows element spectra of the amorphous phase (1,2)

Ttn12 (14d) perovskite (prv) - titanite (tttn) interface: open grain boundary with amorphous phase and pores (TEM foil #1932)
Interface between perovskite and titanite; the grain boundary is partly tight indicated by the diffraction contrast (image on the right); the black dots (left image) are interpreted as pores at the interface.

Interface between titanite and rutile is tight as indicated by the diffraction contrast (image on the left); the black dots (left image) are interpreted as pores at the interface. A line scan shows a smooth transition between the element contents of titanite and rutile.

Ttn12 (14d) perovskite (prv) - titanite - rutile interface: (TEM foil #1934)

Appendix Figure 2; page 4; Ttn12
RT17 (60d) Series of 4 TEM images over a chemical Ti-Al zoning in titanite. The diffraction contrast indicates no change in the structure of the titanite. (TEM foil #1934).
RT17 (60d) Partly filled pores at titanite - titanite grain boundaries. (TEM foil #1937)
Appendix Figure 2; page 7; RT17

Overview

Closed grain boundary between titanite and rutile; the diffraction patterns terminate at the grain boundary.

RT17 (60d) analyses by EDX close to the grain boundary reveal either titanite (upper panel) or rutile (lower panel).