

Supplementary Materials

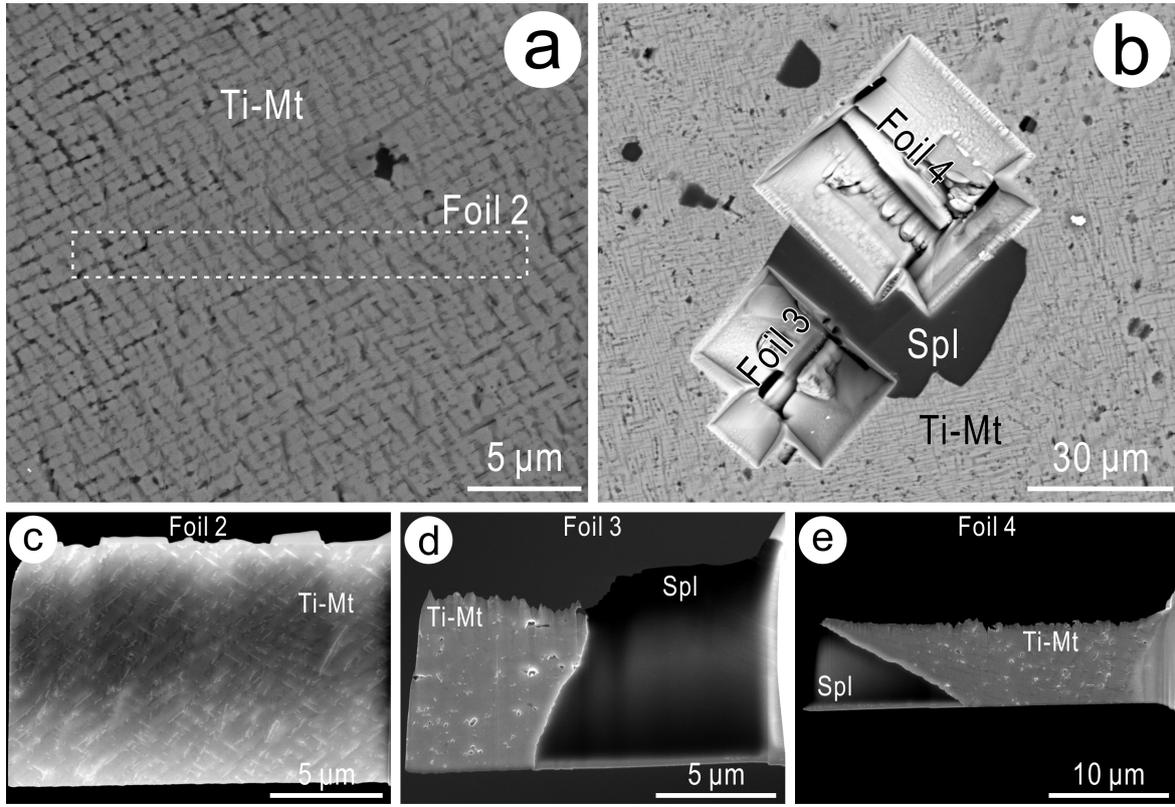


Figure S1. Back-scatter electron (BSE) images and secondary electron (SE) images showing the locations (a,b) and morphologies (c-e) of the other three foils. (a) Foil 2 was extracted from the core of titanomagnetite (Ti-Mt), with fine lamellae of ilmenite (Ilm) along {100} or {111} orientations in host Ti-Mt, and spinel (Spl) along or at the junctions of these two orientations. (b) Foils 3 and 4 were extracted from a coarser Spl grain in Ti-Mt. Foil 3 is perpendicular to Foil 4. (c-e) In-depth, the Ti-Mt and Spl show comparable features with those described on the surface of the polished blocks.

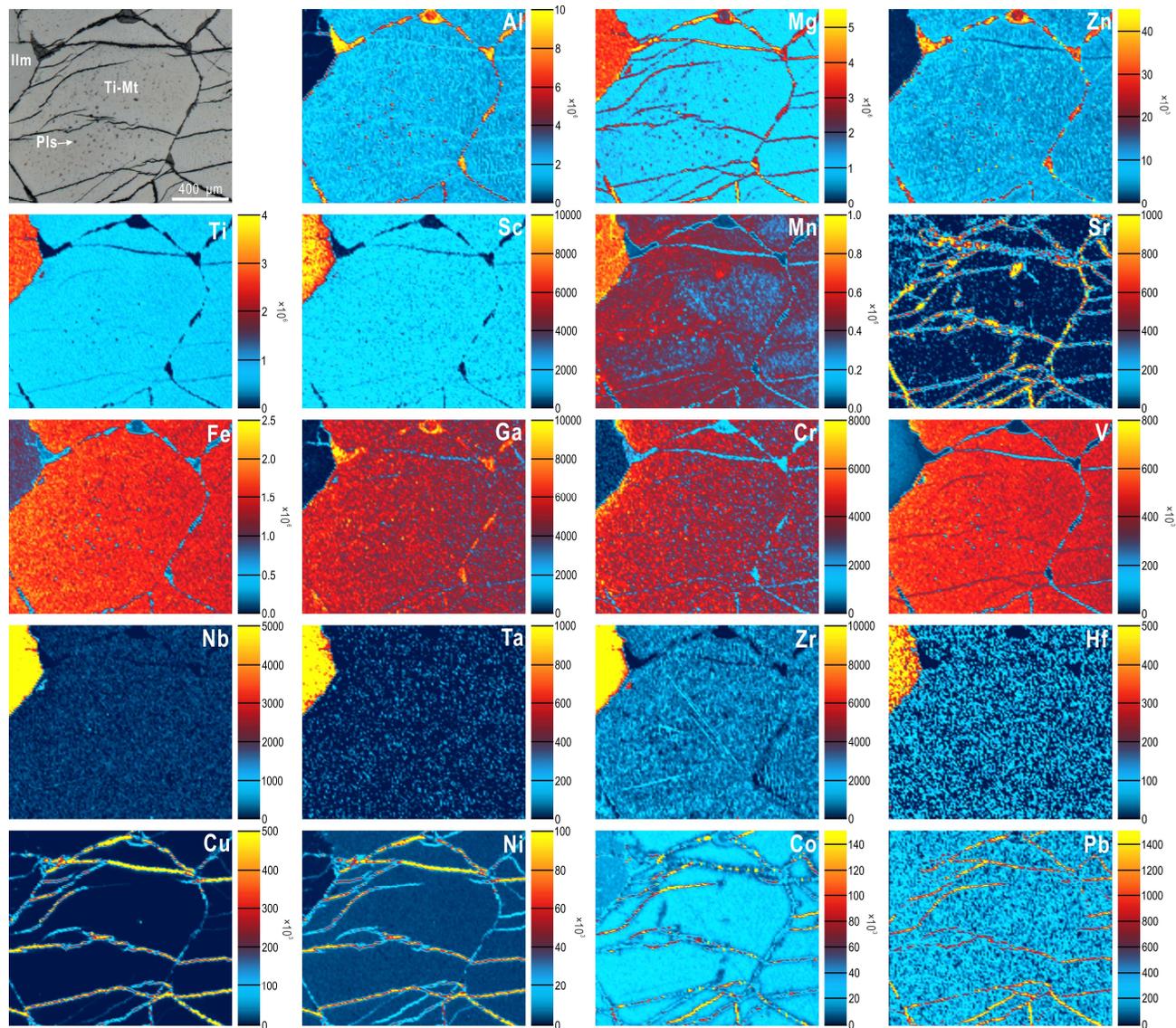


Figure S2. Reflected light photograph (top left) and extended set of LA-ICP-MS element maps for Figure 2.

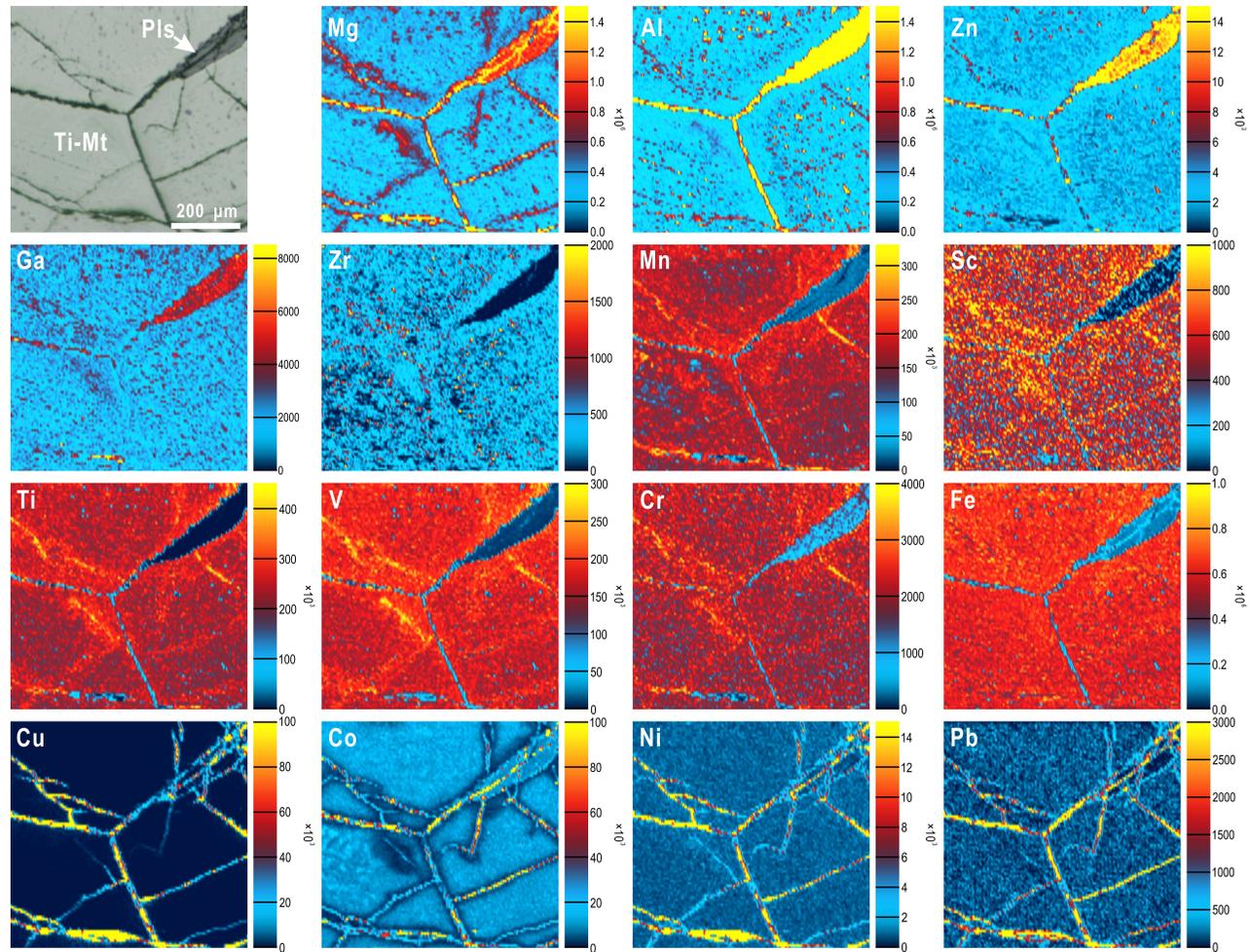


Figure S3. Reflected light photograph (top left) and extended set of LA-ICP-MS element maps for Figure 3.

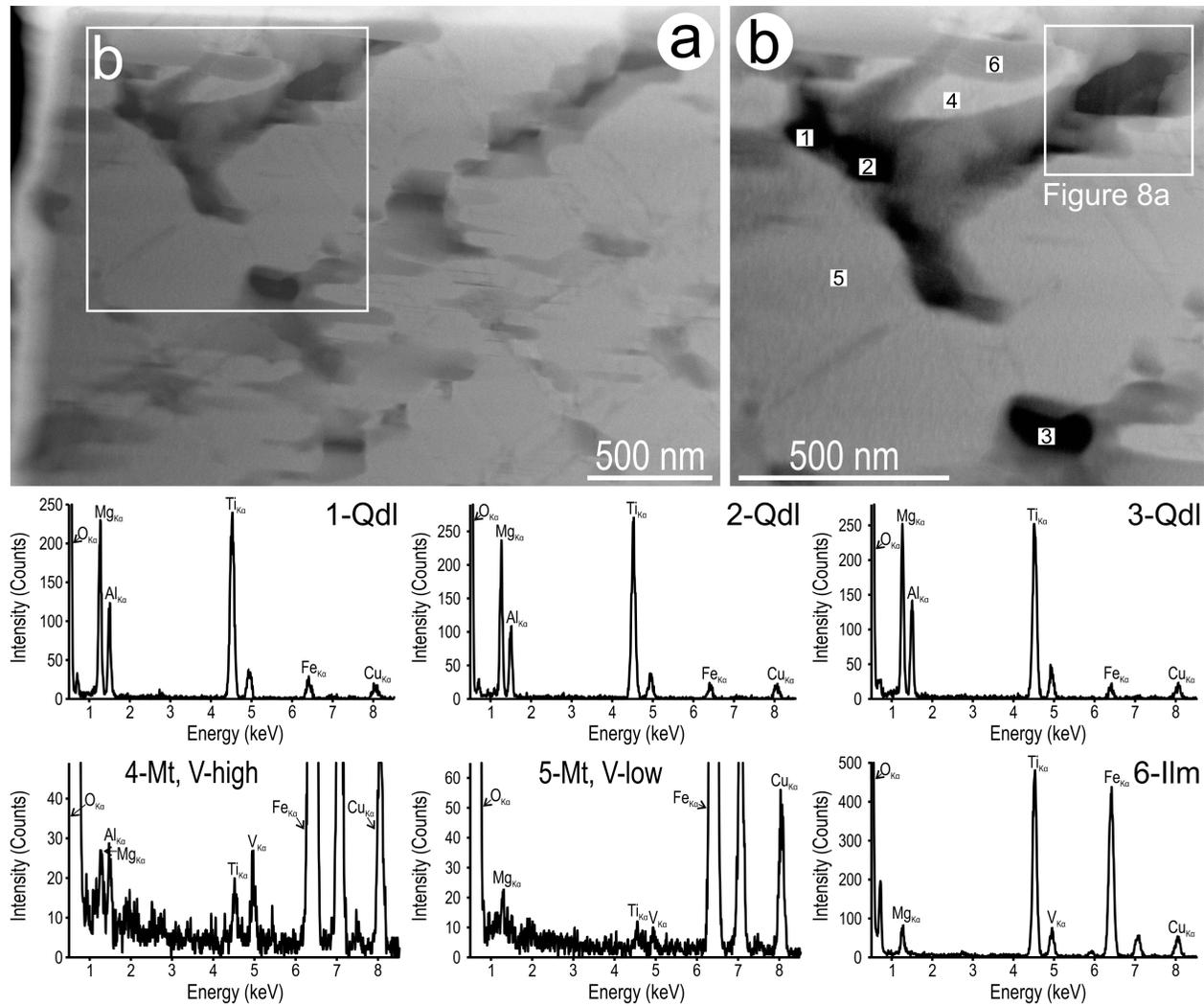


Figure 4. HAADF STEM image (a,b) and STEM EDS spectra obtained from the points as marked on the image (b). The first three spectra (1–3) show the composition of qandilite (Qdl). The other three spectra (4–6) show the variable Ti and V content in ilmenite (Ilm) and magnetite (Mt). The Cu peak is from the TEM grid.

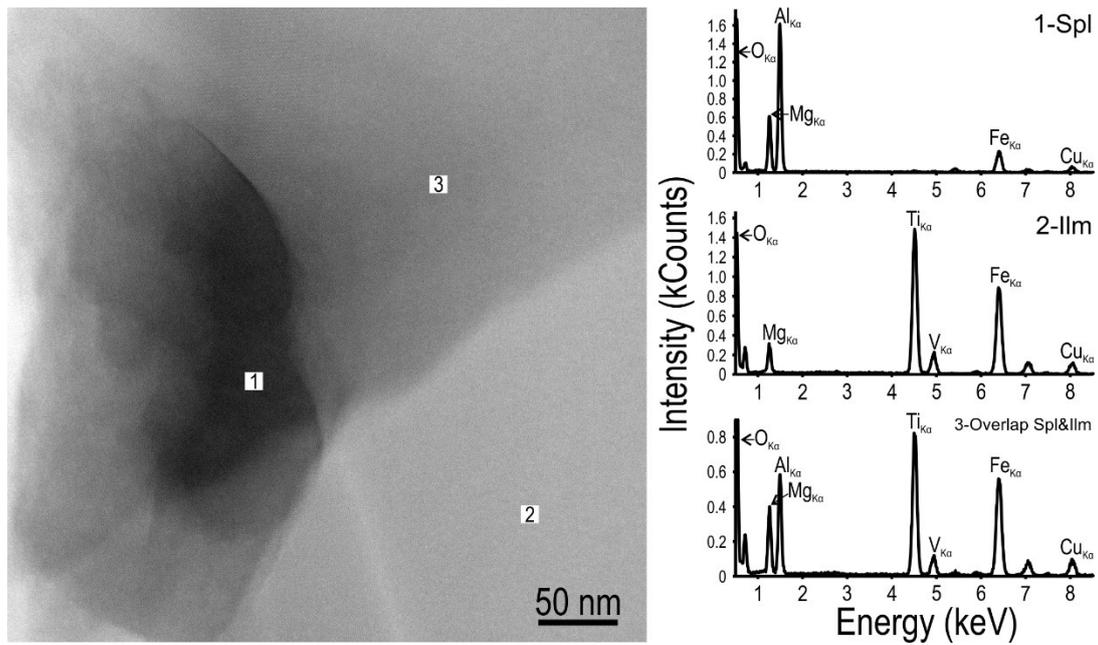


Figure S5. HAADF STEM image (left) and STEM EDS spectra obtained from the points as marked on the image. Spectrum 3 shows the overlay of the spinel (Spl) and ilmenite (Ilm). The Cu peak is from the TEM grid.

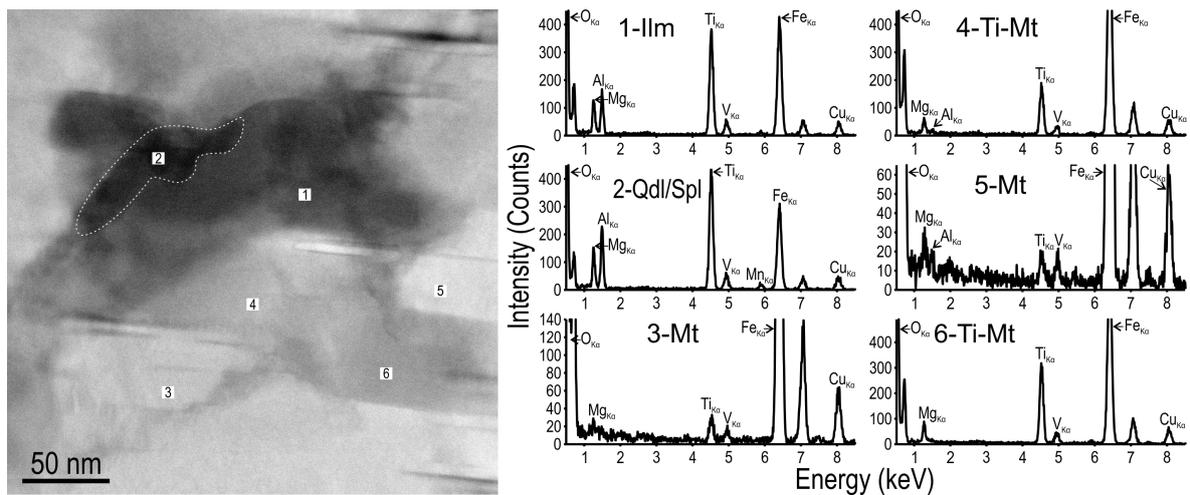


Figure S6. HAADF STEM image (left) and STEM EDS spectra obtained from the points as marked on the image. The spectra (1–6) show the variable Ti and V content in ilmenite (Ilm), titanomagnetite (Ti-Mt), magnetite (Mt), qandilite (Qdl), or spinel (Spl). The Cu peak is from the TEM grid.