P-T-deformation-Fe^{3+}/Fe^{2+} mapping at the thin section scale

O. Vidal, V. de Andrade and E. Lewin

LGCA, Université Joseph Fourier, Grenoble, France (olivier.vidal@ujf-grenoble.fr)

Quantitative X-ray maps of composition from a chlorite, K-white mica, albite, quartz and garnet bearing thin section from Sambagawa blueschist facies metapelites are combined with a multi-equilibrium calculation method. This allowed us to calculate a P-T-Fe^{3+}/Fe^{2+}-deformation map at the millimetre scale. The calculated map of Fe^{2+}/Fe^{3+} in chlorites is in good agreement with the in-situ mapping of this ratio using XANES techniques. Our results suggest that it is possible to constrain a P-T-deformation history from metapelites devoid of low-variance paragenesis. The calculated P-T-deformation maps provide information about the relations between deformation and mineral reactivity, and about the modalities of deformation with time (continuous versus discontinuous deformation), as well as the P-T conditions at which it occurred.