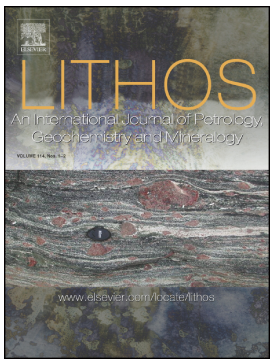

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Textural evolution during high-pressure dehydration of serpentinite to peridotite and its relation to stress orientations and kinematics of subducting slabs: insights from the Almirez ultramafic massif

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Abstract

The Almirez ultramafic massif (SE Spain) preserves the transformation of high-P antigorite (Atg-) serpentinite to chlorite (Chl-) harzburgite (1.6–1.9 GPa; 680–710 °C), a metamorphic reaction that is the primary source of water at the intermediate depth of subducting slabs. We present a detailed μ-CT and EBSD study of oriented samples across the Atg-serpentinite dehydration isograd to investigate the textural evolution during serpentinite dehydration to peridotite and its relation to stress orientations and the kinematics of subducting slabs.

Above the Atg-out isograd, Atg-serpentinite shows a prograde mylonitic foliation and a weak Shape Preferred Orientation (SPO) of oxide aggregates defining a N–S stretching lineation. The antigorite Crystal Preferred Orientation (CPO) is characterized by $[001]_{Atg}$ perpendicular to the foliation, and the poles to $(100)_{Atg}$ and $(010)_{Atg}$ distributed in a girdle-like