

HIGHLIGHTS AND BREAKTHROUGHS

An examination of the Ti-in-quartz thermobarometer in rocks that contain dynamically recrystallized quartz: Re-equilibration of [Ti] during recrystallization

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Abstract: As metamorphic petrologists attempt to understand the pressure-temperature-time-deformational history of metamorphic rocks, numerous thermobarometers have been developed that help recreate that history. As these thermobarometers are developed, they invariably mature as they are tested on various metamorphic assemblages. In the work “Ti resetting in quartz during dynamic recrystallization: Mechanisms and significance,” by Ashley et al. in this issue, the authors demonstrate that the metamorphic process of dynamic recrystallization of quartz lowers the [Ti] in quartz as recrystallizing quartz crystals re-equilibrate in equilibrium with the composition of the intergranular medium, which is typically undersaturated in Ti. The authors conclude that analyses using the TitaniQ thermobarometer in rocks that contain dynamically recrystallized quartz cannot be meaningfully interpreted until methods are developed that can account quantitatively for the reduction of [Ti] resulting from crystal plastic flow. The paper is essential reading for all who use thermobarometers that use quartz as one of the reacting phases.

Keywords: Titanium, quartz, dynamic recrystallization, TitaniQ