

HIGHLIGHTS AND BREAKTHROUGHS

Dolomite discloses a hidden history of subducting slabs

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Abstract: Dolomite and magnesite are the major carbon reservoirs in the subducted oceanic lithosphere. Compositional complexities in dolomite and magnesite solid solutions are often overlooked, but normal and oscillatory zoning in dolomite from mafic eclogites of Tianshan (China) demonstrates that prograde pressure—temperature histories and interactions with coexisting mixed fluids can be recorded in carbonates. Thermodynamic modeling and comparison with experimental results warn against a simplistic approach to carbonate-bearing assemblages and show that magnesite occurrence is not an unambiguous evidence for ultrahigh-pressure metamorphism. **Keywords:** Dolomite, magnesite, eclogite, Tianshan, oscillatory zoning, REE