

HRTEM evidence for 8-reversals in the $m = 17$ antigorite polysome

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ABSTRACT

Structural imaging of the “odd” $m = 17$ antigorite polysome is in keeping with the X-ray structure refinement, supplying direct evidence for the presence of 8-reversals. HRTEM also displays the polysomatic and stacking disorder features modeled during X-ray refinement to achieve convergence.

Polysomatic faults occur in Mg₁₅₉ antigorite as (100) lamellae, with wavelength differing from the matrix by only one serpentine module ($m = 16$ or 18 vs. 17). Mixed ordered polysomes may also occur, such as a regular alternation of $m = 16$ and $m = 17$ lamellae, producing a complex polysome with an a repeat distance of 84.5 \AA .

“Odd” and “even” antigorite polysomes differ in layer topology. “Odd” polysomes ($m \neq 2n$, with $n = \text{integer}$) have a primitive cell with Pm space group, m tetrahedral and $m-1$ octahedral modules, and one 6-reversal and one 8-reversal per unit cell. Polysomes with $m = 2n$ have C -centered cells ($C2/m$), m tetrahedral and $m-2$ octahedral modules, and two 6-reversals and two 8-reversals per cell.