

HRTEM analysis of dislocation cores and stacking faults in naturally deformed biotite crystals

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ABSTRACT

HTREM images of naturally deformed, mylonitized biotite crystals were examined to determine where deformation-related defects occur in the structure. Dislocations were found to be associated with the plane of oxygen atoms that constitutes the base of the octahedral sheet and the apical plane of the tetrahedral sheet, rather than in the interlayer as has been generally assumed. Consistent with previous investigations, this region was also confirmed as the position at which stacking faults occur. The location of these defects was determined by comparing sub-unit-cell scale fringes in experimental images to simulated images with dislocation cores and stacking faults. Previous investigations have generally relied on indirect techniques and have yielded ambiguous results.