
The Microstructure of Vermicular Glaucony

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Abstract: Vermicular glaucony grains observed by transmission electron microscopy (TEM) show three irregularly alternating zones. Zone A has a high degree of linear orientation, no void space, and relatively defect-free lattice-fringe images. Zone B has an amalgamated bundle texture with a sub-parallel, linear orientation of bundles to each other and to zone A. Zone B has little or no void space, and lattice images appear to be a combination of those typical of zone C with minor amounts of modified zone A forms. Zone C has a randomly oriented, curved, and circular or semicircular bundle texture. In addition, zone C has much void space and curvilinear and linear lattice-fringe images with numerous defects, including edge dislocations. Such morphologic and crystallographic characteristics indicate that zones B and C probably comprise the glauconitic minerals of the vermicular glaucony grains, and that zone A comprises non-glauconitic micaceous minerals of higher structural order. Zone B is sharply demarcated from zone A, but B zone bundle textures merge gradationally to those of zone C. These spatial relationships suggest that zone B forms first on the surface of zone A. Sub-parallel orientation in the B zone could be produced by initial confinement between adjacent A zones. Once constraints change or are removed, the randomly oriented, curved, and semicircular or circular bundles of zone C develop.

Key Words: Transmission electron microscopy • Vermicular glaucony

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