Chlorite Examination by Ultramicrotomy and High Resolution Electron Microscopy

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Abstract: Mafic chlorite from Benton, Arkansas was comminuted by rotary blending of a suspension, and the −2 μm fraction separated by sedimentation in H_2O. Droplets of suspension of the < 2 μm fraction were dried on a layer of Epoxy resin and then additional Epoxy was added and heat-cured at 48 ° C to form a resin sandwich. Cross-sections of 600 – 900 Å thickness were cut on a Reichert automated ultramicrotome. The sections were collected on standard electron microscope specimen screens, reinforced by vacuum evaporated *C* and examined by transmission electron microscopy (TEM). The Phillips EM 200 electron microscope was equipped with a " microgun " source to minimize heating of the specimen and to improve contrast and high resolution (HREM). Images of the (001) chlorite crystallographic planes spaced at 13 · 9 Å intervals were visible on many of the particle sections. Imaging of the planes depended upon their being nearly parallel to the electron beam (within 0 ° 10′) and therefore, many particles which had other orientations did not show the 13 · 9 Å image. Micrographs made before appreciable irradiation by the electron beam revealed images of fringes corresponding to the 7 · 22 Å (002) spacing of chlorite. Loss of the 7 · 22 Å fringes and reinforcement of those at 13 · 9 Å resulted from heating of the chlorite in the electron beam. This behavior is analogous to the well-known crystallographic effects of heating chlorite at 550 – 760 ° C.

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