

## CLINOCHLORE



A common member of the chlorite group found in low grade metamorphic terrains and as an alteration product of mafic minerals; forms a solid solution series with its  $\text{Fe}^{2+}$  analog, chamosite (q.v.). Much of the “clinocllore” replacing garnet from the Republic and Michigamme iron districts cited in the literature is probably chamosite (e.g., Dorr and Eschman, 1970; Morris, 1983). “Pennine,” “ripidolite,” and “prochlorite” are obsolete synonyms. Northern Peninsula.

**Dickinson County:** Jensen quarry at Randville: Occurs locally in the Randville Dolomite at contact with aplite dikes (Conrad, 1952).

**Gratiot County:** Near Ithaca, T10N, R2W in Michigan Basin Deep Drill Hole in both altered basalt-gabbro units as replacement of olivine, interstitial glass, and possibly some clinopyroxene. Also in veinlets cutting lower unit basalt: chlorite-actinolite and serpentine-chlorite-epidote (Heinrich and Pollack, 1978). Chlorites from the lower unit have been analyzed (McCallister et al., 1978) and found to be ferroan clinocllore. From X-ray diffraction data Stakes (1978) determined a similar composition with a I1b polytype.



Figure 59: Clinocllore crystals from the Clark mine, near Copper Harbor, Keweenaw County. Crystals are approximately 1 mm across. Dan Behnke specimen and photograph.

**Houghton County:** 1. Hancock mine: In base of amygdules (Moore and Beger, 1963). 2. Isle Royale mine: Gray-white pseudo-hexagonal crystals and masses (the latter sometimes mislabelled as

“collyrite” = kaolinite). 3. Osceola mine, Calumet: Aggregates of hollow pseudo-hexagonal white crystals to 3mm occurred on the 7th level north at the Osceola mine (A. E. Seaman Mineral Museum collection, Michigan Technological University). Energy dispersion X-ray spectra of this material show it is essentially end-member clinocllore.

**Keweenaw County:** 1. Moore and Beger (1963) indicate that “pennine” is the most abundant chlorite in altered copper lode rocks. 2. South of Eagle Harbor: A chlorite in drill core EH-1-1357, analyzed by Jolly and Smith (1972), yielded a composition corresponding to ferroan aluminian clinocllore admixed with a smectite group mineral. 3. Mandan mine: As small, gray-green, pseudotrigonal crystals intergrown with saponite, lining cavities in brecciated prehnite. 4. Clark mine: As yellow-gray microcrystals (D. Behnke, personal communication, 1991).

**Marquette County:** Marquette and Sands quadrangles: “Prochlorite” is reported as a constituent of the Mona Schist (metabasalt) (Gair and Thaden, 1968).

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### UPDATE

**Gogebic County:** NW ¼ section 5, T45N, R39W: As rosettes to 1 cm in veins in gneiss (M. Heilman, personal communication, 2009).

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