

ANALCIME



In Michigan, analcime occurs as a common, relatively widespread vein and vug mineral in the copper deposits, with numerous occurrences known in the Kearsarge and Ashbed lodes, particularly near the tops of the flows. However, nowhere is it especially abundant. It is a late mineral (post-copper mineralization in age) and is often associated with calcite, copper, quartz, apophyllite, adularia, and saponite. Superb specimens have been found in fissure lodes as well (e.g., Phoenix mine). Crystals typically form simple colorless-to-white trapezohedrons, though fine examples of complexly twinned individuals are also known. In altered basalts analcime may replace plagioclase phenocrysts and associated albite, K-feldspar, laumontite, and prehnite. In Copper Falls veins it is replaced by prehnite and calcite. Analyses given by Livnat (1983) show only slight variations in composition ranging from $\text{Na}_{0.91}\text{Al}_{0.95}\text{Si}_{2.05}\text{O}_{5.98} \cdot n\text{H}_2\text{O}$ to $\text{Na}_{0.88}\text{Al}_{0.92}\text{Si}_{2.08}\text{O}_{5.98} \cdot n\text{H}_2\text{O}$. Northern Peninsula.

Houghton County: **1.** *Franklin mine:* Crystals up to 6 cm across. **2.** Old Colony mine at Calumet: Occurs as fine crystals. **3.** Isle Royale mine: Some in veins with copper sulfide (chalcocite), adularia, and natrolite (Lane, 1911). **4.** *Quincy mine,* Hancock: Rarely in crystals up to 6 cm (A.E. Seaman Mineral Museum collection, Michigan Technological University, specimen DM 15692). White-to-colorless trapezohedral crystals to 1.5 cm associated with quartz were found in the Pontiac mine (Quincy Number 9 Shaft). **5.** Wolverine mine, Kearsarge (4, 5, Morris, 1983). **6.** *Red Jacket shaft,* Calumet: As glassy trapezohedral crystals up to 1cm on quartz crystals. **7.** *Rhode Island mine,* near Boston Location, SE ¼ section 5, T55N, R33W: Occurs in somewhat distorted trapezohedral crystals up to nearly 5 cm with pseudocubic calcite crystals. **8.** Naumkeag mine, near Houghton, SW ¼ section 35, T55N, R34W: As iron-stained trapezohedrons up to 1 cm on quartz crystals. **9.** Centennial mine: As pink trapezohedral crystals to 12 mm (T. M. Bee, personal communication, 1999).



Figure 33: *Analcime with native copper from the Phoenix mine, Phoenix, Keweenaw County. 6 × 7.5 cm.*

A. E. Seaman Mineral Museum specimen No. LLH 267, Jeffrey Scovil photograph.

Keweenaw County: **1.** Central mine. **2.** *Copper Falls:* Fine reddish crystals associated with natrolite (Spiroff, 1964). Also as rare pseudomorphs after feldspar (?) to 1cm. **3.** Northwestern mine: Whitney (1859) refers to these last two occurrences as the finest localities. The analcime occurs in trapezohedrons as large as 2.5 cm across associated with adularia. Some specimens are covered by a thin crust of chrysocolla. The radially fibrous and granular bright red type also was abundant in the old Copper Falls vein. **4.** Owl Creek near Copper Falls (Spiroff, 1938). **5.** Petherick vein near Copper Falls: Fairly large etched crystals have been collected both from outcrops and surface trenches near the Petherick vein. **6.** *Phoenix mine:* Crystals up to 1 cm across were described by Penfield (1885). Twinned 2.5 cm crystals were found perched on copper. Numerous fine specimens showing even larger crystals from this locality may be seen in mineralogical museums worldwide. **7.** Keweenaw Point: Apparently a fine locality in the early mining period (Whitney, 1859). **8.** Ashbed mine: Fine-grained, red, granular type crystals are very abundant. **9.** Gratiot Mountain: In rhyolite. **10.** *Cliff mine:* With datolite, apophyllite, and laumontite (Williams, 1966; Morris 1983). **11.** *Seneca mine,* Mohawk: Orange to white crystals with natrolite (Morris 1983). **12.** Garden City mine: Red crystals with natrolite (Rominger, 1895). **13.** Ahmeek Number 3 and 4 mines: Rare as clear, red, glassy crystals (Hawke, 1976). **14.** Mohawk

Number 2 mine. Good crystals (T. M. Bee, written communication, 1985). **15.** Clark mine: Microcrystals up to 10 mm (Bee and Dagenhart, 1984). **16.** Five Mile Point: In Copper Harbor Conglomerate in the amygdaloidal part of a porphyritic andesite (Cornwall, 1954). **17.** Allouez Number 1 mine: As microcrystals in cavities in conglomerate (Yedlin, 1974). **18.** Point prospect: As thin veinlets and anhedral crystals up to 1 to 2 mm exhibiting bright blue-white fluorescence in UV light (S. M. Carlson, personal communication, 1999). The cause of the fluorescence is unknown.

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Figure 34: Analcime with calcite, probably from the Phoenix mine, Phoenix, Keweenaw County. 3.5 x 5.5 cm. A. E. Seaman Mineral Museum specimen No. DCG 1357, Jeffrey Scovil photograph.

Marquette County: Negaunee mine, Negaunee: As glassy, white trapezohedral crystals to 1 cm embedded in radiating calcite crystals filling a cavity in a hematitic matrix. This highly unusual paragenesis is represented by specimens in the collection of the A. E. Seaman Mineral Museum, Michigan Technological University (e.g., AES 170).

Ontonagon County: Zeolites are relatively uncommon in the southern part of the Lake Superior copper district. A notable exception, however, is the Henwood mine, where chalky-white, etched analcime crystals up to 3 cm have been found (S. M. Carlson, personal communication, 2000).