

BORNITE



Widespread in hydrothermal veins and volcanogenic massive sulfide deposits. Bornite often replaces earlier-formed copper sulfides. Northern Peninsula.

Gratiot County: Near Ithaca, T10N, R2W in Michigan Basin Deep Drill Hole in the altered upper basaltic-gabbroic unit. An accessory with digenite and native copper in albite-chlorite-calcite-epidote rock (McCallister et al., 1978).

Houghton County: 1. Baltic mine: With chalcocite in fissure veins. Other associated minerals are chalcopyrite, laumontite, dolomite, and epidote (Butler and Burbank, 1929; Broderick, 1931; Mortenson, 1953; Mihelcic, 1954). 2. Isle Royale mine: In veins with chalcocite, chalcopyrite, copper arsenides, pyrrhotite (?), natrolite, analcime, and adularia (Lane, 1911). 3. Also throughout the copper district disseminated in small amounts in the Greenstone flow (Cornwall, 1951a).

Iron County: Sherwood and Buck iron mines: With other sulfides and uraninite (Vickers, 1956b; James et al., 1968).

Keweenaw County: 1. Mendota mine at Mount Bohemia: In veinlets with chalcopyrite and chalcocite that cut "oligoclase" diorite (Bhatt, 1952; Juilland, 1965; Robertson, 1975). 2. In stromatolites (calcite) in the Copper Harbor Conglomerate near Copper Harbor with copper (q.v.), cuprite, chalcocite, and domeykite. Microscopic (Nishioka et al., 1984). 3. Gratiot Lake chalcocite deposit, sections 6 and 7, T57N, R30W and sections 1 and 12, T57N, R31W: As a minor constituent associated with chalcocite, pyrite, and lesser amounts of covellite in brecciated amygdaloid flow tops in the Portage Lake Volcanics (Maki, 1999).

Marquette County: 1. Eastern Marquette Range near Enchantment Lake, SW ¼ NE ¼ section 32, T48N, R25W: In quartz veins with chalcocite, pyrite, and specular hematite cutting siliceous dolomite (Reed, 1967a, b). 2. Eastern Marquette Range, NW ¼ SE ¼ section 2, T47N, R25W: Occurs as cupriferous veins and pods in coarsely clastic bands in gray and tan slate (Reed, 1967a, b). 3. Beacon iron mine (Dorr and

Eschman, 1970). 4. Cliffs Shaft iron mine, Ishpeming: Found in veins in upper part of Negaunee Iron Formation with chalcopyrite (partly replaced by bornite), pyrite, and hematite (Reed, 1967a, b). It was also found in a vein of solid sulfides 60 cm thick. 5. Champion mine, 36th level, 55 meters east of Number 7 shaft station in the footwall slope: Found in quartz vein that cuts massive granular magnetite ore containing also chalcopyrite, tourmaline, molybdenite, and muscovite (Babcock, 1966a, b). 6. Yellow Dog peridotite, sections 11 and 12, T50N, R29W: Trace amounts of secondary bornite with covellite and marcasite are constituents in the accessory sulfide assemblage (Klasner et al., 1979).

Ontonagon County: White Pine mine: a. Disseminated microscopically in the Cu-Fe transition zone of the Nonesuch Shale. Two types were recognized by Brown (1968): one is associated with chalcocite and covellite, is pseudomorphous after pyrite, and turns blue after several hours of air exposure. The second variety occurs with digenite and stays pink longer. Bornite also is found in small amounts in veinlets in the chloritic facies of the Copper Harbor Conglomerate (Hamilton, 1967).

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UPDATE

Baraga County: See Part IV.

Marquette County: Massive with other sulfides in calcite veins on Presque Isle, Marquette. Confirmed by energy dispersion X-ray spectrometry (M. Heilman, personal communication, 2008).

Menominee County: See Part IV.

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