

## **MONAZITE-(Ce)**



A widespread rare-earth mineral, particularly of the cerium subgroup of rare-earth elements. Often, monazite-(Ce) is radioactive, due to its thorium content, and is an accessory mineral of granites, pegmatites, and high-grade gneisses. It also is found in various hydrothermal veins and beach placers, which may be consolidated and incorporated into sandstone beds. These eventually become metamorphosed to quartzite and are known as fossil placers. Northern Peninsula.

**Houghton County:** Centennial mine: With anthonyite (Williams, 1963b).

**Marquette County:** **1.** Eight kilometers south of Ishpeming: As a fossil placer in boulders of Goodrich Quartzite (Brock and Reed, 1979). **2.** Gwinn district, 19 km southeast of Palmer: Similar occurrence in a gray arkosic quartzite resting on granite porphyry (Vickers, 1956a). **3.** Old Volunteer and Maitland mines in the Palmer area: Rounded to subrounded 0.10 to 0.20 mm grains in the matrix of a quartz-pebble conglomerate. Locally, monazite-(Ce) may constitute as much as 50% of the matrix, and form lenses up to 2 mm thick. Gamma-ray logging of three drill holes showed that most of the monazite is concentrated more than 100 meters above the base of the Goodrich. Detailed descriptions, analyses, and reserves are given by Irving and Van Hise (1892), Vickers (1956a), Gair (1975), and Parker (1981). **4.** Republic area: Monazite-(Ce) is a ubiquitous minor accessory mineral in the Bell Creek Granite (Hoffman, 1987). **5.** Marquette Mall, approximately 2.5 km west of downtown Marquette on highway M-28: Monazite occurs as a minor accessory mineral in a brecciated pyrite-carbonate unit exposed in an outcrop south of the Marquette Mall. Other minerals present include ilmenite, chalcopyrite, covellite, and sphalerite (Duskin and Quigley, 1999).

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