BIRNESSITE

\((\text{Na, Ca})_{0.5}(\text{Mn}^{4+},\text{Mn}^{3+})_2\text{O} \cdot 1.5\text{H}_2\text{O}\)

A dark, brownish black manganese oxide mineral that usually forms in relatively low-temperature environments as a result of weathering or oxidation of manganese-rich rocks. Northern Peninsula.

**Marquette County:** Jubilee IGA store excavation, Highway 41, Ishpeming: As etched, black pseudomorphs after small rhombohedral crystals of rhodochrosite on Negaunee Iron Formation. Verified by X-ray diffraction. This represents the first reported occurrence of birnessite in Michigan.