**Thermonatrite**  \( \text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O} \)

**Crystal Data:** Orthorhombic.  **Point Group:** \( mm2 \). Very rare in acicular crystals; typically as powdery crusts and efflorescences.

**Physical Properties:**  **Cleavage:** On \{100\}, difficult.  **Tenacity:** Somewhat sectile.
Hardness = 1–1.5  \( \text{D(meas.)} = 2.255 \) (synthetic).  \( \text{D(calc.)} = 2.262 \)  Soluble in \( \text{H}_2\text{O} \), alkaline taste; dehydrates readily.

**Optical Properties:**  **Color:** Colorless to white, gray, pale yellow; colorless in transmitted light.  **Luster:** Vitreous.
**Optical Class:** Biaxial \((\neg)\).  **Orientation:** \( X = b; Y = c; Z = a \).  **Dispersion:** \( r < v \), weak.
\( \alpha = 1.420 \quad \beta = 1.506 \quad \gamma = 1.524 \quad 2V(\text{meas.}) = 48^\circ \)

**Cell Data:**  **Space Group:** \( P2_1bc \) (synthetic).  \( a = 6.472(2) \quad b = 10.724(3) \quad c = 5.259(2) \)
\( Z = 4 \)

**X-ray Powder Pattern:** Synthetic.
2.768 (100), 2.372 (60), 2.753 (55), 2.678 (55), 2.684 (50), 2.475 (30), 2.010 (25)

**Chemistry:** (1) Identification depends on coincidence of X-ray powder pattern and optical properties with synthetic material.

**Occurrence:** Typically on soils and deposited from saline lakes; uncommon in volcanic fumaroles; in hydrothermal veins related to carbonatites.

**Association:** Trona, natron, halite.

**Distribution:** In minor amounts in deserts worldwide. On Vesuvius, Campania, Italy. In Russia, from the Kola Peninsula, on Mts. Rasvumchorr and Kukisvumchorr, and in the Vuonnemiok River valley, Khibiny massif; at Mt. Alluaiv, Lovozero massif; and in the Kovdor massif. From the Ilímaussaq intrusion, Greenland. At Mont Saint-Hilaire, Quebec, Canada. In the USA, crystallized from Borax Lake, Lake Co., and at Deep Spring Lake, Inyo Co., California; at Point of Rocks, east of Springer, Colfax Co., New Mexico. In the Lake Bogoria basin, Rift Valley, Kenya. Around Mt. Erebus, Victoria Land, Antarctica.

**Name:** From the Greek for heat and natron, as the dehydration product from heating natron.