Clinokurchatovite \[ \text{Ca}(\text{Mg}, \text{Fe}^{2+}, \text{Mn}^{2+})\text{B}_2\text{O}_5 \]

**Crystal Data:** Monoclinic.  
*Point Group:* \(2/m\). As twinned crystals, to 2 mm.  
*Twinning:* Contact and polysynthetic on \(\{010\}\).

**Physical Properties:**  
Hardness = 4.5 \(D(\text{meas.}) = 3.07–3.08\) \(D(\text{calc.}) = [3.10]\)

**Optical Properties:**  
Semitransparent.  
*Color:* Colorless.  
*Optical Class:* Biaxial (–).  
*Orientation:* \(Y \wedge a = 64^\circ; Y \wedge b = 38^\circ; Z \wedge a = 26^\circ; Z \wedge b = 52^\circ; \) \(\alpha = 1.642–1.644\) \(\beta = 1.674–1.675\) \(\gamma = 1.699–1.704\) \(2V(\text{meas.}) = 82^\circ–88^\circ\)

**Cell Data:**  
*Space Group:* \(P2_1/b\).  
\(a = 12.450\) \(b = 5.514\) \(c = 11.145\) \(\beta = 104.13^\circ\) \(Z = 8\)

**X-ray Powder Pattern:**  
Sayak-IV deposit, Kazakhstan.  
3.045 (10), 2.799 (10), 3.093 (8), 1.937 (8), 2.586 (5), 2.027 (5), 1.236 (5)

**Chemistry:**

\[
\begin{array}{c|c|c}
\text{Component} & (1) & (2) \\
\hline
\text{B}_2\text{O}_3 & [37.7] & 41.94 \\
\text{FeO} & 7.1 & \\
\text{MnO} & 0.9 & \\
\text{MgO} & 21.9 & 24.28 \\
\text{CaO} & 32.4 & 33.78 \\
\hline
\text{Total} & [100.0] & 100.00 \\
\end{array}
\]

1. Sayak-IV deposit, Kazakhstan; average of three analyses, \(\text{B}_2\text{O}_3\) by difference; corresponds to \(\text{Ca}_{1.00}(\text{Mg}_{0.94}\text{Fe}_{0.17}\text{Mn}_{0.02})\text{B}_{2}\text{O}_5\).  
2. \(\text{CaMgB}_2\text{O}_5\).

**Polymorphism & Series:** Dimorphous with kurchatovite.

**Occurrence:** A replacement of kurchatovite in boron-bearing rocks.

**Association:** Kurchatovite, suanite, ludwigite, szabélyite, sakhaite, clinohumite, svabite, sphalerite (Solongo deposit, Russia).

**Distribution:** From the Sayak-IV boron deposit, northeast Balkhash region, Kazakhstan. In Russia, at the Solongo boron deposit, Buryatia; from the Titovskoye boron deposit, Tas-Khayakhtakh Mountains, Sakha; in the Novofrolovskoye copper deposit, near Krasnoturinsk, Turinsk district, Northern Ural Mountains.

**Name:** As the monoclinic dimorph of kurchatovite.

**Type Material:** A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 82777.

**References:**  
3. Simonov, M.A., Y.K. Yegorov-Tismenko, M.A. Yamnova, E.L. Belokoneva, and N.V. Belov (1980) Crystal structure of natural monoclinic kurchatovite \(\text{Ca}_2(\text{Mg}_{0.86}\text{Fe}_{0.14})(\text{Mg}_{0.92}\text{Fe}_{0.08})[\text{B}_2\text{O}_5]_2\). Doklady Acad. Nauk SSSR, 251, 1125–1128 (in Russian).