Kosmochlor

\( \text{NaCr}^{3+}\text{Si}_2\text{O}_6 \)

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Crystal Data: Monoclinic. Point Group: \( 2/m \). Short prismatic crystals, to 2 mm; in fibrous and polycrystalline aggregates. Twinning: Simple, lamellar on \{100\}, \{001\}.

Physical Properties: Cleavage: Good on \{110\}, (110) and (100) \( \sim 87^\circ \); parting on \{001\}. Hardness = \( \sim 6 \) D(meas.) = 3.51–3.60 D(calc.) = 3.60

Optical Properties: Semi-transparent. Color: Emerald-green; green or yellow in thin section. Optical Class: Biaxial (-). Pleochroism: Strong; \( X = \) yellowish green; \( Y = \) blue-green, grass-green; \( Z = \) emerald-green. Orientation: \( Y = b \); \( Z \sim a \), \( \gamma = 87 \pm 2^\circ \). Dispersion: \( \rho > v \); moderate to strong. \( \alpha = 1.740–1.766 \) \( \beta = 1.756–1.778 \) \( \gamma = 1.745–1.781 \) \( 2V(\text{meas.}) = 6^\circ–70^\circ \)

Cell Data: Space Group: \( C2/c \). \( a = 9.550 \) \( b = 8.712 \) \( c = 5.273 \) \( \beta = 107.44^\circ \) \( Z = 4 \)

X-ray Powder Pattern: Synthetic. 2.956 (100), 2.867 (100), 2.5166 (90), 2.4476 (70), 2.0985 (70), 1.5957 (70), 1.3802 (60)

Chemistry: (1) (2) (1) (2)
\[
\begin{align*}
\text{SiO}_2 & \quad 55.5 & 54.81 & \quad \text{MgO} & \quad 0.8 & 0.49 \\
\text{TiO}_2 & \quad 0.03 & & \quad \text{CaO} & \quad 1.7 & 0.54 \\
\text{Al}_2\text{O}_3 & \quad 4.02 & & \quad \text{Na}_2\text{O} & \quad 11.6 & 12.94 \\
\text{Fe}_2\text{O}_3 & \quad 0.2 & 3.61 & \quad \text{K}_2\text{O} & \quad 0.97 & 0.02 \\
\text{Cr}_2\text{O}_3 & \quad 30.6 & 23.67 & \quad \text{P}_2\text{O}_5 & \quad 0.09 & \\
\text{MnO} & \quad 0.02 & & & & \\
\text{Total} & & & & 100.4 & [100.24]
\end{align*}
\]
(1) Coahuila meteorite; by electron microprobe, corresponds to \( (\text{Na}_{0.83}\text{Ca}_{0.17})\Sigma=0.90 \)
(\( \text{Cr}_{0.90}\text{M}_{0.04})\Sigma=0.94\text{Si}_{2.06})\text{O}_6 \). (2) Myanmar; by electron microprobe, average of seven analyses, average sum originally given as 100.19%; corresponds to \( (\text{Na}_{0.93}\text{Ca}_{0.02})\Sigma=0.95(\text{Cr}_{0.69}\text{Al}_{0.17}) \)
(\( \text{Fe}_{0.10}\text{Mg}_{0.03})\Sigma=0.99\text{Si}_{2.02})\text{O}_6 \).

Mineral Group: Pyroxene group.

Occurrence: A major constituent of some jadeitites; an accessory constituent of some iron meteorites.

Association: “Cliftonite” [graphite], chromian diopside, troilite (Toluca); daubréelite (Coahuila); krinovite, roedderite, high albite, richterite, chromite (Canyon Diablo); jadeite, chromite, chlorite (Myanmar).

Distribution: In the Toluca, Coahuila, Hex River Mountains, and Canyon Diablo meteorites. Around Tawmaw and other towns, Myitkyina-Mogaung district, Kachin State, Myanmar (Burma). At Mocchie, Susa, Piedmont, Italy. From Williams Creek, Mendocino Co., California, USA.

Name: From the German kosmisch, for cosmic, in allusion to its meteoritic occurrence, and the Greek chlör, for green.


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