Siwaqaite  \( \text{Ca}_6\text{Al}_2(\text{CrO}_4)_3(\text{OH})_{12}\cdot 26\text{H}_2\text{O} \)

**Crystal Data:** Hexagonal.  \( \text{Point Group: } 3m \).  As hexagonal prismatic crystals to 250 \( \mu \text{m} \), terminated by a hexagonal pyramidal or a pinacoid; commonly in granular aggregates to ~50 \( \mu \text{m} \).

**Physical Properties:**  \( \text{Cleavage: } \text{Perfect on } (10\overline{1} 0) \).  \( \text{Fracture: } \text{Uneven or irregular} \).  \( \text{Tenacity: } \text{Brittle} \).  \( \text{Hardness } = \sim 2 \).  \( D(\text{meas.}) = \text{n.d.} \).  \( D(\text{calc.}) = 1.819 \).

**Optical Properties:**  \( \text{Translucent} \).  \( \text{Color: } \text{Canary-yellow} \).  \( \text{Streak: } \text{Yellowish gray} \).  \( \text{Luster: } \text{Vitreous} \).  \( \text{Optical Class: } \text{Uniaxial } (-) \).  \( \omega = 1.512(2) \).  \( \varepsilon = 1.502(2) \).  \( \text{Orientation: } E = c. \)

**Cell Data:**  \( \text{Space Group: } P\overline{3}1c \).  \( a = 11.3640(2) \).  \( c = 21.4485(2) \).  \( Z = 2 \).

**X-ray Powder Pattern:**  \( \text{Calculated pattern.} \)

\[
\begin{align*}
9.8415 \ (100), & \ 5.682 \ (65), \ 4.7086 \ (38), \ 2.7984 \ (33), \ 3.8998 \ (29), \ 3.2805 \ (17), \ 5.0208 \ (16) \\
\end{align*}
\]

**Chemistry:**

\[
\begin{align*}
\text{Cr}_2\text{O}_3 & : 12.80 \quad 22.81 \\
\text{SO}_3 & : 6.78 \\
\text{SeO}_3 & : 3.80 \\
\text{SiO}_2 & : 0.55 \\
\text{Al}_2\text{O}_3 & : 7.14 \quad 7.75 \\
\text{CaO} & : 25.20 \quad 25.59 \\
\text{H}_2\text{O} & : [42.89] \quad 43.85 \\
\text{Total} & : 99.16 \quad 100.00
\end{align*}
\]

(1) North Siwaqa complex, Hashem region, Jordan; average of 12 electron microprobe analyses supplemented by Raman and FTIR spectroscopy, \( \text{H}_2\text{O} \) calculated from stoichiometry; corresponds to \( \text{Ca}_{6.01}(\text{Al}_{1.87}\text{Si}_{0.12})\Sigma=1.99[\{(\text{CrO}_4)_{1.71}(\text{SO}_4)_{1.13}(\text{SeO}_4)_{0.40}\}e^{-3.2d}(\text{OH})_{11.63}]\cdot 26\text{H}_2\text{O} \).

(2) \( \text{Ca}_6\text{Al}_2(\text{CrO}_4)_3(\text{OH})_{12}\cdot 26\text{H}_2\text{O} \).

**Mineral Group:** Ettringite group.

**Occurrence:** In thin veins and small cavities in spurrite marble of a high-temperature low-pressure pyrometamorphic sequence of rocks.

**Association:** Calcite, fluorapatite, brownmillerite, minerals of the barite-hashemite series, cuspidine, fluororayenite, gehlenite, perovskite, lakargite.

**Distribution:** North Siwaqa complex, Lisdan-Siwaqa Fault, Hashem region, 60 km south of Amman, Jordan.

**Name:** From the name of the locality, Siwaqa area, where the mineral was found.

**Type Material:** A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (5277/1).

**References:** (1) Juroszek, R., B. Krüger, I. Galuskina, H. Krüger, Y. Vapnik, and E. Galuskin (2020) Siwaqaite, \( \text{Ca}_6\text{Al}_2(\text{CrO}_4)_3(\text{OH})_{12}\cdot 26\text{H}_2\text{O} \), a new mineral of the ettringite group from the pyrometamorphic Daba-Siwaqa complex, Jordan. Amer. Mineral., 105(3), 409-421.