Strontioginorite $SrCaB_{14}O_{20}(OH)_6 \cdot 5H_2O$

Crystal Data: Monoclinic. *Point Group:* $2/m$. As thick tabular {010} crystals, prismatic along [001], to 3 mm, with dominant {110}, {010}, {111}, and six other forms. *Twinning:* On (010) twin plane with $[\bar{1}01]$ twin axis.

Physical Properties: *Cleavage:* On {010}, perfect; on {001}, very good. *Tenacity:* Easily deformed. Hardness = 2–3 D(meas.) = 2.25(1) D(calc.) = 2.265

Optical Properties: Transparent. *Color:* Colorless. *Luster:* Silky.
Optical Class: Biaxial (+). *Orientation:* $Y = b$; $Z \wedge c = 38°–42°$; $Z \wedge [\bar{1}01] = –49°$ to $–54°$.
$\alpha = 1.512–1.515$ $\beta = 1.524–1.526$ $\gamma = 1.573–1.577$ 2V(meas.) = 49°–53°

Cell Data: *Space Group:* $P2_1/a$. $a = 12.817(8)$ $b = 14.448(8)$ $c = 12.783(8)$
$\beta = 101°25(5)'$ Z = 4

X-ray Powder Pattern: Königshall-Hindenburg mine, Germany.
7.25 (vs), 2.10 (s), 5.40 (m), 3.92 (m), 3.34 (m), 1.19 (m), 4.75 (mw)

Chemistry: (1) Stoichiometry established by analogy to ginorite, and validated by close similarity of X-ray powder patterns, optical properties and densities; formula from crystal structure analysis; SrO 10%–20% by X-ray fluorescence analysis, corresponding to as much as $Sr(Ca_{0.66}Sr_{0.34})_{\Sigma=1.00}B_{14}O_{20}(OH)_6 \cdot 5H_2O$.

Occurrence: A rare insoluble residue in salt beds (Königshall-Hindenburg mine, Germany).

Association: Halite, anhydrite (Königshall-Hindenburg mine, Germany).

Distribution: From the Königshall-Hindenburg potash mine, Reyershausen, near Göttingen, Lower Saxony, Germany. At the Inder borate deposit, Kazakhstan. From the Furnace Creek district, Death Valley, Inyo Co., California, USA. In the Tincalayu borax deposit, Salar del Hombre Muerto, Salta Province, Argentina.

Name: As the *strontium* analog of *ginorite*.

Type Material: National Museum of Natural History, Washington, D.C., USA, 114168.

References: (1) Braitsch, O. (1959) Über Strontioginorit, eine neue Ginorit-Varietät aus dem Zechsteinsalz. Beitr. Mineral. u. Petrog., 6, 366–370 (in German). (2) (1960) Amer. Mineral., 45, 478 (abs. ref. 1). (3) Konnert, J.A., J.R. Clark, and C.L. Christ (1970) Crystal structure of strontioginorite, $(Sr, Ca)_2B_{14}O_{20}(OH)_6 \cdot 5H_2O$. Amer. Mineral., 55, 1911–1931. (4) Christian, R.P., G.D. Eberlein, and J.A. Konnert (1974) Optical and X-ray crystallographic investigations of strontioginorites. J. Res. U.S. Geol. Surv., 2(6), 699–700.