Guérinite $Ca_5(AsO_4)_2(AsO_3OH)_2 \cdot 9H_2O$

Crystal Data: Monoclinic. *Point Group:* $2/m$. As wedge-shaped prismatic crystals, to 3 mm; in sprays, as spherulites or rosettes of acicular to platy crystals.

Physical Properties: *Cleavage:* Perfect, ‖ plane of the plates; good, ‖ elongation; poor, ⊥ to elongation. *Tenacity:* Brittle. Hardness = 1.5 D(meas.) = 2.68–2.76 D(calc.) = 2.74

Optical Properties: Translucent to opaque. *Color:* Colorless, white. *Luster:* Vitreous to pearly.
Optical Class: Biaxial (–). *Orientation:* Z = elongation; $X \wedge c = 10°$ ⊥ plane of the plates. *Dispersion:* $r > v$, strong; rarely $r < v$. $\alpha = 1.574(1)$ $\beta = 1.582(1)$ $\gamma = 1.582(1)$
2V(meas.) = 7°–15°

Cell Data: *Space Group:* $P2_1/n$ (synthetic). $a = 17.63(1)$ $b = 6.734(3)$ $c = 23.47(2)$ $\beta = 90.6(1)°$ Z = 5

X-ray Powder Pattern: Wittichen, Germany.
14.0 (FFF), 3.89 (FF), 3.01 (FF), 2.90 (FF), 3.49 (F), 11.7 (mF), 4.84 (mF)

Chemistry:

	(1)	(2)
As_2O_5	49.76	49.95
CaO	30.06	30.47
H_2O	19.18	19.58
insol.	0.40	
Total	99.40	100.00

(1) Sainte-Marie-aux-Mines, France. (2) $Ca_5(AsO_4)_2(AsO_3OH)_2 \cdot 9H_2O$.

Polymorphism & Series: Dimorphous with ferrarisite.

Occurrence: A recent weathering product in oxidizing arsenic-rich mineral deposits.

Association: Realgar, erythrite, quartz, calcite.

Distribution: In Germany, from the Daniel mine, Schneeberg, Saxony; at the Bauhaus district, Richelsdorf, Hesse; from the Anton mine, Heubachtal, near Schiltach, and at Wittichen, Black Forest. At Sainte-Marie-aux-Mines, Haut-Rhin, France. In the USA, at Sterling Hill, Ogdensburg, Sussex Co., New Jersey, and in the Getchell mine, Potosi district, Humboldt Co., Nevada.

Name: Honors Henri Guérin (1906–), who synthesized the compound.

Type Material: n.d.

References: (1) Nefedov, E.I. (1961) Guerinite, a new mineral. Materialy Vses. Nauchno-Issled. Geol. Inst., 45, 113–115 (in Russian). (2) (1962) Amer. Mineral., 47, 416–417 (abs. ref. 1). (3) Pierrot, R. (1964) Contribution à la minéralogie des arséniates calciques et calcomagnésiens naturels. Bull. Minéral., 87, 169–211 (in French). (4) Catti, M. and G. Ferraris (1974) Crystal structure of $Ca_5(HAsO_4)_2(AsO_4)_2 \cdot 9H_2O$ (Guérinite). Acta Cryst., 30, 1789–1794.