Nickelschneebergite $BiNi_2(AsO_4)_2[(H_2O)(OH)]$

Crystal Data: Monoclinic. *Point Group:* $2/m$. Prismatic grains, elongated along $[10\overline{1}]$, fibrous, radial or lamellar ∥ {010}, may show {010}, {100}, $\{10\overline{1}\}$, to 0.2 mm.

Physical Properties: *Cleavage:* {010}, perfect; {100}, $\{10\overline{1}\}$, good. Hardness = ∼3
D(meas.) = n.d. D(calc.) = 4.06

Optical Properties: Semitransparent. *Color:* Bright blue. *Luster:* Vitreous.
Optical Class: Biaxial (+). *Pleochroism:* Light blue to blue. *Orientation:* $Y = b$; $Z \wedge a = 28°$.
$\alpha = 1.714(5)$ $\beta = 1.744(5)$ $\gamma = 1.783(5)$ 2V(meas.) = 60(6)° 2V(calc.) = 84°

Cell Data: *Space Group:* $C2/c$. $a = 11.882(4)$ $b = 12.760(4)$ $c = 6.647(2)$
$\beta = 112.81(2)°$ Z = 4

X-ray Powder Pattern: Nickenicher Sattel volcano, Germany.
2.744 (10), 3.195 (4), 4.06 (3), 4.35 (3), 3.56 (3), 3.066 (3), 2.605 (3b)

Chemistry:

	(1)
P_2O_5	0.9
As_2O_5	64.3
V_2O_5	0.06
Al_2O_3	1.1
Fe_2O_3	5.5
MnO	0.5
CuO	4.7
MgO	17.9
CaO	2.8
Na_2O	4.6
K_2O	0.1
Total	102.5

(1) Nickenicher Sattel volcano, Germany; by electron microprobe, total Fe as Fe_2O_3, total Mn as MnO; corresponds to $(Na_{0.81}K_{0.01})_{\Sigma=0.82}Ca_{0.27}Cu_{0.32}(Mg_{2.42}Fe_{0.38}Al_{0.12}Mn_{0.03})_{\Sigma=2.95}[(As_{1.02}P_{0.02})_{\Sigma=1.04}O_4]_3$; crystal-structure analysis gives $Na_{0.76}Ca_{0.41}Cu_{0.39}(Mg_{2.33}Fe_{0.52}Al_{0.12}Mn_{0.03})_{\Sigma=3.00}[(As_{0.98}P_{0.02})_{\Sigma=1.00}O_4]_3$.

Occurrence: In a cavity in volcanic scoria.

Association: Vanadinite, duhamelite.

Distribution: From the Nickenicher Sattel volcano, Eifel district, Germany.

Name: For the village of Nickenich, Germany, nearby the Nickenicher Sattel volcano.

Type Material: University of Vienna, Vienna, Austria.

References: (1) Auernhammer, M., H. Effenberger, G. Hentschel, T. Reinecke, and E. Tillmanns (1993) Nickenichite, a new arsenate from the Eifel, Germany. Mineral. Petrol., 48, 153–166. (2) (1994) Amer. Mineral., 79, 571 (abs. ref. 1).