

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

Physical Properties: *Cleavage:* {010}, perfect; {100}, {10 $\bar{1}$ }, 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)
 $\beta = 112.81(2)^\circ$ 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 ₂ O ₅	0.9
As ₂ O ₅	64.3
V ₂ O ₅	0.06
Al ₂ O ₃	1.1
Fe ₂ O ₃	5.5
MnO	0.5
CuO	4.7
MgO	17.9
CaO	2.8
Na ₂ O	4.6
K ₂ O	0.1
Total	102.5

(1) Nickenicher Sattel volcano, Germany; by electron microprobe, total Fe as Fe₂O₃, 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}) $_{\Sigma=1.04}$ O₄]₃; crystal structure determination 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}) $_{\Sigma=1.00}$ O₄]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).