

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. As euhedral to subhedral crystals, to 1 mm, tabular on {010}, elongated along [001], exhibiting {100}, {010}, {001}, {101}, and an {hk0} form.

Physical Properties: *Cleavage:* Very good on {010}, good on {001}. *Hardness* = 3.5 VHN = 136–165, 152 average (100 g load). *D(meas.)* = 5.88 *D(calc.)* = 6.04

Optical Properties: Opaque. *Color:* Pale gray with an orange tint; creamy gray to pale gray with a yellow-brown tint in reflected light *Streak:* Grayish black. *Luster:* Metallic. *Optical Class:* Biaxial. *Pleochroism:* Distinct. *Anisotropism:* Weak; gray with shades of blue and yellow-orange to red-brown. *Birefractance:* Low.

R_1 – R_2 : 35.7–36.4 (470), 34.1–39.0 (546), 39.8–40.2 (589), 40.9–42.2 (650)

Cell Data: *Space Group:* $P2_12_12_1$. $a = 7.509(2)$ $7.514(3)$ $b = 12.551(2)$ $12.557(6)$
 $c = 4.877(1)$ $4.8880(2)$ $Z = 4$

X-ray Powder Pattern: Grüne Au mine, Germany.
2.975 (100), 3.177 (80), 1.837 (70), 2.087 (60) 1.863 (50), 2.895 (40), 2.232

Chemistry:

| | (1) | (2) |
|-------|------|--------|
| Cu | 15.1 | 14.87 |
| Ni | 14.0 | 13.73 |
| Sb | 2.1 | |
| Bi | 45.6 | 48.89 |
| S | 22.9 | 22.51 |
| Total | 99.7 | 100.00 |

(1) Grüne Au mine, Germany; by electron microprobe, average of seven analyses; corresponds to $\text{Cu}_{1.00}\text{Ni}_{1.01}(\text{Bi}_{0.92}\text{Sb}_{0.07})_{\Sigma=0.99}\text{S}_{3.01}$. (2) CuNiBiS_3 .

Occurrence: In dump material at a polymetallic hydrothermal deposit, topotactically replacing lapieite.

Association: Lapieite, millerite, bismuthinite, sphalerite, aikinite, polydymite.

Distribution: From the Grüne Au mine, Schutzbach, 15 km southwest of Siegen, North Rhine-Westphalia, Germany [TL].

Name: Honors Dr. Arno Mücke (1937–), German mineralogist, Mineralogical-Petrological Institute, Göttingen University, Göttingen, Germany, for his work in systematic and ore mineralogy.

Type Material: Göttingen University, Göttingen; Tübingen University, Tübingen, Germany.

References: (1) Schnorrer-Köhler, G., U. Neumann, and T. Doering (1989) Mückeite, CuNiBiS_3 , a new ore mineral from the Grüne Au mine, Schutzbach/Siegerland. Neues Jahrb. Mineral., Monatsh., 193–200. (2) (1990) Amer. Mineral., 75, 708 (abs. ref. 1). (3) Bente, K., T. Doering, A. Edenharter, V. Kupecik, M. Steins, and M. Wendschuh-Josties (1990) Structure of the new mineral mückeite, BiCuNiS_3 . Acta Cryst., C46, 127–128.