

Crystal Data: Orthorhombic. *Point Group:* *mm2*. Typically as fibrous aggregates of parallel intergrowths with other bismuthinite–aikinite minerals.

Physical Properties: Hardness = n.d. VHN = 148–188 (100 g load). D(meas.) = n.d. D(calc.) = 6.98

Optical Properties: Opaque. *Color:* Steel-gray; in polished section, grayish white. *Luster:* Metallic.

R₁–R₂: (400) 39.8–46.9, (420) 40.0–46.7, (440) 40.1–46.3, (460) 40.2–46.2, (480) 40.1–46.3, (500) 39.9–46.5, (520) 39.7–46.7, (540) 39.4–46.9, (560) 39.1–47.0, (580) 38.9–46.9, (600) 38.8–46.8, (620) 38.6–46.5, (640) 38.3–46.2, (660) 38.0–45.8, (680) 37.8–45.4, (700) 37.5–44.8

Cell Data: *Space Group:* *Pb2₁m* *a* = 11.200(9) *b* = 11.560(9) *c* = 4.003(3) *Z* = 2

X-ray Powder Pattern: Juno mine, Australia. 3.137 (100), 2.841 (37), 3.645 (30), 3.160 (27), 2.660 (26), 1.970 (26), 3.552 (24)

Chemistry:	(1)	(2)	(3)
Pb	19.9	19.3	19.01
Cu	4.6	5.95	5.83
Bi	57.4	59.8	57.51
Se		0.95	
S	18.0	17.25	17.65
Total	[99.9]	103.25	100.00

(1) Krupka, Czech Republic; by electron microprobe, average of three analyses; corresponds to Pb_{1.03}Cu_{0.77}Bi_{2.94}S_{6.00}. (2) Juno mine, Australia; by electron microprobe, corresponds to Pb_{1.02}Cu_{1.02}Bi_{3.12}(S_{5.87}Se_{0.13})_{Σ=6.00}. (3) PbCuBi₃S₆.

Occurrence: Rare in hydrothermal veins.

Association: Gladite, bismuthinite, aikinite, bismuth, cassiterite, quartz.

Distribution: In the Czech Republic, from the Barbora gallery, Krupka, Krušné hory Mountains [TL] and at Bohutin, near Příbram. At Dobšiná (Dobschau), Slovakia. From Ocna de Fier (Morávicza; Vaskő); Baia Borşa, Baia Mare (Nagybánya); and Sasca Montană, Romania. At the Zidarovo copper deposit, Bulgaria. In Austria, in the Waschgang Au–Cu deposit, Goldberg Mountains, Upper Carinthia, and from the Felbertal tungsten mine, Salzburg. In the Loch Shin monzogranite, near Lairg, Scotland. From the Carrock mine, Caldbeck Fells, Cumbria, England. From Inkur, Transbaikal, Russia. At the Funiushan copper skarn, near Nanjing, Jiangsu Province, China. From Australia, in the Juno mine, Tennant Creek, Northern Territory. At Temiskaming, Quebec, Canada. In the USA, from Cucomungo Spring, Tule Canyon district, Esmeralda Co., Nevada; in Ball’s mine, Little Cottonwood district, Salt Lake Co., Utah; and at the Alice mine, Alice district, Clear Creek Co., Colorado. At the Cordón do los Galeses, Andes Mountains, Chubut Province, Argentina.

Name: For the locality in the Czech Republic at Krupka.

Type Material: Charles University, Prague, Czech Republic, 14522.

References: (1) Žák, L., V. Syneček, and J. Hybler (1974) Krupkaite, CuPbBi₃S₆, a new mineral of the bismuthinite–aikinite group. *Neues Jahrb. Mineral., Monatsh.*, 533–541. (2) Syneček, V. and J. Hybler (1974) The crystal structure of krupkaite, CuPbBi₃S₆, and of gladite, CuPbBi₅S₉, and the classification of superstructures in the bismuthinite–aikinite group. *Neues Jahrb. Mineral., Monatsh.*, 541–560. (3) (1975) *Amer. Mineral.*, 60, 737 (abs. refs. 1). All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without the prior written permission of Mineral Data Publishing.

and 2). (4) Mumme, W.G. (1975) The crystal structure of krupkaite, $\text{CuPbBi}_3\text{S}_6$, from the Juno mine at Tennant Creek, Northern Territory, Australia. *Amer. Mineral.*, 60, 300–308. (5) Topa, D., E. Makovicky, and W.H. Paar (2002) Composition ranges and exsolution pairs for the members of the bismuthinite–aikinite series from Felbertal, Austria. *Can. Mineral.*, 40, 849–869. (6) Topa, D., E. Makovicky, and T. Balić-Žunić (2002) The structural role of excess Cu and Pb in gladite and krupkaite based on new refinements of their structure. *Can. Mineral.*, 40, 1147–1159. (7) Criddle, A.J. and C.J. Stanley, Eds. (1993) *Quantitative data file for ore minerals*, 3rd ed. Chapman & Hall, London, 302.