Kolitschite $Pb[Zn_{0.5}\square_{0.5}]Fe_3(AsO_4)_2(OH)_6$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. Steeply pseudo-rhombohedral crystals to 0.2 mm display {110} and {001}. *Twinning*: Ubiquitous by 120° rotations about the pseudohexagonal axis.

Physical Properties: *Cleavage*: None. *Fracture*: Uneven. *Tenacity*: Brittle. Hardness = 4 D(meas.) = >4.2 D(calc.) = 4.648

Optical Properties: Transparent to translucent. *Color*: Yellowish green. *Streak*: Light yellow. *Luster*: Adamantine.
Optical Class: Biaxial (+) [pseudo-uniaxial (+)]. *n*(calc.) = 2.0 2V(meas.) ≤ 10°
Orientation: *Y* = *b*. Straight extinction. *Pleochroism*: Very weak, *X* = green to olive-green, *Y* = green to olive-green, Z = yellowish green to apple-green. *Absorption*: *X* ≈ *Y* > *Z*.

Cell Data: *Space Group*: *C*2/*c*. *a* = 25.8898(6) *b* = 14.8753(2) *c* = 12.1700(2) β =110.681(1)° Z =16

X-ray Powder Pattern: Kintore opencut, Broken Hill, New South Wales, Australia.
33.114 (100), 6.034 (45), 2.280 (37), 3.719 (31), 2.844 (25), 2.569 (21), 1.508 (19)

Chemistry:

	(1)	(2)
Pb	26.06	26.86
Fe	21.63	21.72
Zn	2.19	2.12
Cu	0.27	
Al	0.11	
As	19.46	19.42
S	0.25	
P	0.03	
O	30.42	29.03
H		0.85
Total	100.42	100.00

(1) Kintore opencut, Broken Hill, New South Wales, Australia; average electron microprobe analysis, H for charge balance; corresponds to $Pb_{0.94}Zn_{0.25}Cu_{0.03}(Fe_{2.89}Al_{0.03})_{\Sigma=2.92}H_{0.76}[(As_{1.94}S_{0.06}P_{0.01})O_8](OH)_6$. (2) $Pb[Zn_{0.25}\square_{0.75}]Fe_3(AsO_4)_2(OH)_6$.

Polymorphism & Series: Solid-solution series between $Pb[Zn_{0.25}\square_{0.75}]Fe_3(AsO_4)_2(OH)_6$ and $Pb[Zn_{0.5}\square_{0.5}]Fe_3(AsO_4)_2(OH)_6$.

Mineral Group: Alunite supergroup.

Occurrence: From supergene alteration of primary Pb-Zn ore.

Association: Mimetite, segnitite, carminite, bayldonite, cryptomelane.

Distribution: From the Kintore opencut, Broken Hill, New South Wales, Australia.

Name: Honors Dr. Uwe *Kolitsch* (b. 1966), Curator of Mineralogy, Natural History Museum, Vienna, Austria, for his contributions to mineralogy - in particular the characterization of new minerals, in crystallography, and work on alunite-group minerals.

Type Material: Museum Victoria, Melbourne, Victoria, Australia (M41714).

References: (1) Mills, S.J., I.E. Grey, W.G. Mumme, R. Miyawaki, S. Matsubara, P. Bordet, W.D. Birch, and M. Raudsepp (2008) Kolitschite, $Pb[Zn_{0.5},\square_{0.5}]Fe_3(AsO_4)_2(OH)_6$, a new mineral from the Kintore opencut, Broken Hill, New South Wales. Australian J. Mineral., 14, 63-67.
(2) Grey, I.E., W.G. Mumme, and P. Bordet (2008) A new crystal-chemical variation of the alunite-type structure in monoclinic $PbZn_{0.5}Fe_3(AsO_4)_2(OH)_6$. Can. Mineral., 46, 1355-1364.