

Crystal Data: Triclinic. *Point Group:* 1. As blocky composite grains, to 1 mm, intergrown with the Ca analogue of zigrasite and an unnamed phase of composition Zr(PO₃OH)₂(H₂O)₄.

Physical Properties: *Cleavage:* Imperfect on (010) and (001). *Fracture:* Hackly. *Tenacity:* Brittle. *D(meas.)* = 2.76(4) *D(calc.)* = 2.66 *Hardness* = 3 Displays light blue to pale yellow cathodoluminescence.

Optical Properties: Translucent. *Color:* Off-white to pale-yellow or light tan; colorless in transmitted light. *Streak:* White. *Luster:* Vitreous.
Optical Class: Biaxial (-). $\alpha = 1.597(1)$ $\beta = 1.622(1)$ $\gamma = 1.635(1)$ $2V(\text{meas.}) = 65.5(4)^\circ$
 $2V(\text{calc.}) = 71^\circ$ *Pleochroism:* None. *Orientation:*

	<i>a</i>	<i>b</i>	<i>c</i>
X	78.2°	94.0°	164.8°
Y	98.2°	9.6°	102.7°
Z	14.4°	81.3°	81.8°

Cell Data: *Space Group:* P1. $a = 5.3049(2)$ $b = 9.3372(4)$ $c = 9.6282(5)$
 $\alpha = 97.348(1)^\circ$ $\beta = 91.534(1)^\circ$ $\gamma = 90.512(4)^\circ$ $Z = 2$

X-ray Powder Pattern: Dunton Quarry, Newry, Oxford County, Maine, USA.
 9.550 (100), 4.108 (70), 4.411 (50), 4.008 (50), 4.589 (40), 3.177 (40), 3.569 (30)

Chemistry:	(1)
P ₂ O ₅	37.59
ZrO ₂	32.27
HfO ₂	0.34
FeO	0.20
MgO	10.37
ZnO	0.17
F	0.13
LOI	18.60
<u>-O = F</u>	<u>0.05</u>
Total	99.62

(1) Dunton Quarry, Newry, Maine, USA; average of 6 electron microprobe analyses; corresponds to (Mg_{0.97}Fe_{0.01}Zn_{0.01})_{Σ=0.99}(Zr_{0.99}Hf_{0.01})_{Σ=1.00}P_{2.00}O₈(H₂O)₄.

Occurrence: One of the last minerals formed in a tourmaline-bearing pocket in a complex rare-element granitic pegmatite.

Association: Tourmaline, microcline, quartz, albite, beryl, amblygonite-montebrazite, childrenite-eosphorite, apatite.

Distribution: From the “giant 1972” tourmaline-bearing pocket, Dunton Quarry, Newry, Oxford county, Maine, USA.

Name: Honors James Zigras (b. 1981) of Paramus, New Jersey, USA., the mineral collector who discovered the mineral.

Type Material: Royal Ontario Museum, Toronto, Canada (M53323).

References: (1) Hawthorne, F.C., N.A. Ball, J.W. Nizamoff, and W.B. Simmons (2009) Zigrasite, MgZr(PO₄)₂(H₂O)₄, a new phosphate mineral from the Dunton Quarry, Newry, Oxford county, Maine, USA. *Mineral. Mag.*, 73(3), 415-420. (2) Hawthorne, F.C. and W.B. Simmons (2010) The crystal structure of zigrasite, MgZr(PO₄)₂(H₂O)₄, a heteropolyhedral framework structure. *Mineral. Mag.*, 74(3), 567-575. (3) (2011) *Amer. Mineral.*, 96, 1660-1661 (abs. refs. 1 & 2).