Akaogiite TiO_2

Crystal Data: Monoclinic. *Point Group*: 2/*m*. As aggregates of randomly oriented submicrometer particles.

Physical Properties: *Cleavage*: n.d. *Fracture*: n.d. *Tenacity*: n.d. Hardness = n.d. D(meas.) = n.d. D(calc.) = 4.72

Optical Properties: n.d. *Color*: Bright white in reflected polarized light, distinguishable from rutile only through its slightly higher brightness and the intense royal blue color of its internal reflections in crossed nicols. *Streak*: n.d. *Luster*: n.d.
Optical Class: n.d.

Cell Data: *Space Group*: $P2_1/c$. $a = 4.606(2)$ $b = 4.896(3)$ $c = 4.933(3)$ $\beta = 99.17(6)°$

X-ray Powder Pattern: Ries meteorite impact crater, Germany.
2.929 (100), 2.626 (91), 2.437 (42), 1.686 (42), 2.017 (40), 1.742 (40), 1.54 (31B)

Chemistry:

	(1)
TiO_2	97.6-97.7
Nb_2O_5	0.15-0.20
FeO	0.11-0.14

(1) Ries meteorite impact crater, Germany; electron microprobe analysis; corresponds to $Ti_{0.998}Fe_{0.002}Nb_{0.001}O_2$.

Polymorphism & Series: Ultra-dense polymorph of rutile and TiO_2-II.

Occurrence: Within multiphase TiO_2 clusters enclosed in biotite in heavily shocked garnet-cordierite-sillimanite gneiss in the breccia of a meteorite impact crater.

Association: Rutile, TiO_2-II, ilmenite, titanite, graphite.

Distribution: From the Ries meteorite impact crater, Germany.

Name: Honors Masaki *Akaogi*, Professor at the Department of Chemistry, Gakushuin University, Tokyo, Japan, for his contributions to experimental petrology, calorimetry, and mineralogy, including experimental characterization of high-pressure polymorphs of TiO_2 relevant to planetary deep interiors.

Type Material: Collection of the Bayerisches Geoinstitut, Universität Bayreuth, Germany (El Goresy section No. BGI 3).

References: (1) El Goresy, A., L. Dubrovinsky, P. Gillet, G. Graup, and M. Chen (2010) Akaogiite: An ultra-dense polymorph of TiO_2 with the baddeleyite-type structure, in shocked garnet gneiss from the Ries Crater, Germany. Amer. Mineral., 95, 892-895. (2) El Goresy, A., M. Chen, L.S. Dubrovinsky, P. Gillet, and G. Graup (2001) An ultra-dense polymorph of rutile with seven coordinated titanium from the Ries crater. Science, 293, 1467-1470.