

Crystal Data: Monoclinic. *Point Group:* $2/m$. Lamellar, massive, to 3 cm.

Physical Properties: *Cleavage:* In two directions, indistinct. *Fracture:* Even to conchoidal. Hardness = 8.5 D(meas.) = 3.10 D(calc.) = 3.08

Optical Properties: Translucent. *Color:* Pale green to bright blue. *Luster:* Vitreous. *Optical Class:* Biaxial (-). *Dispersion:* $r > v$, weak. $\alpha = 1.619$ $\beta = 1.639$ $\gamma = 1.643$ $2V(\text{meas.}) = 49^\circ$

Cell Data: *Space Group:* $I2/c$. $a = 18.894(5)$ $b = 7.161(1)$ $c = 7.162(2)$ $\beta = 99.99(2)^\circ$ $Z = 4$

X-ray Powder Pattern: Champion mine, California, USA.

3.208 (100), 3.095 (90), 3.075 (50), 2.519 (45), 3.336 (40), 6.667 (35), 1.983 (35)

Chemistry:

	(1)	(2)	(3)
P_2O_5	46.72	48.00	47.97
Al_2O_3	43.26	43.87	45.94
Fe_2O_3	2.75	0.34	
CaO	0.97	0.02	
H_2O	6.23	[7.77]	6.09
Total	99.93	[100.00]	100.00

(1) Västana mine, Sweden. (2) Hökensås, Sweden; by electron microprobe, total Fe as Fe_2O_3 , H_2O by difference. (3) $\text{Al}_4(\text{PO}_4)_3(\text{OH})_3$.

Occurrence: In amphibolite-grade metamorphic rocks.

Association: Berlinite, attakolite, augelite, lazulite (Västana mine, Sweden); scorzalite, augelite, viséite (Champion mine, California, USA); montebrazite, scorzalite, bertossaite, brazilianite, apatite, gatumbaite, samuelsonite, wylleite (Buranga pegmatite, Rwanda).

Distribution: In Sweden, from the Västana mine, near Näsrum, Skåne; at Hålsjöberg, Värmland; from Hökensås, Västergötland. In the Buranga pegmatite, Rwanda. On Mt. Perry, 75 km southwest of Bundaberg, Queensland, Australia. In the USA, at the Kyanite Corporation mine on Willis Mountain, Buckingham Co., Virginia; four km west of Glendevy, Larimer Co., Colorado; in the Champion mine, White Mountains, Mono Co., California.

Name: To honor Hans Gabriel Trolle-Wachtmeister (1782–1871), Swedish chemist.

Type Material: Wrocław University, Wrocław, Poland, II-9575.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 911. (2) Sclar, C.B., L.C. Carrison, and C.M. Schwartz (1964) Synthesis and properties of trolleite (aluminian lazulite?), a high-pressure mineral from the Westana iron deposit, Kristianstad, Sweden. Geol. Soc. Amer., Spec. Paper 76, 145. (3) Moore, P.B. and T. Araki (1974) Trolleite, $\text{Al}_4(\text{OH})_3[\text{PO}_4]_3$: a very dense structure with octahedral face-sharing dimers. Amer. Mineral., 59, 974–984. (4) Ek, R. and P. Nysten (1990) Phosphate mineralogy of the Hålsjöberg and Hökensås kyanite deposits. Geol. Fören. Förhandl. Stockholm, 112, 9–18.