Trolleite $Al_4(PO_4)_3(OH)_3$

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(meas.) = 49°

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

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) Västanå mine, Sweden. (2) Hökensås, Sweden; by electron microprobe, total Fe as Fe_2O_3, H_2O by difference. (3) $Al_4(PO_4)_3(OH)_3$.

Occurrence: In amphibolite-grade metamorphic rocks.

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

Distribution: In Sweden, from the Västanå mine, near Näsum, 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 Glendevey, 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: Wroclaw University, Wroclaw, Poland, II–9575.

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