Jasonsmithite $Mn^{2+}_4ZnAl(PO_4)_4(OH)(H_2O)_7 \cdot 3.5H_2O$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. As prisms slightly flattened on {001} and with wedge-shaped terminations to ~1 mm; in subparallel intergrowths.

Physical Properties: *Cleavage*: Perfect on {001}. *Tenacity*: Brittle. *Fracture*: Irregular. Hardness = 2 D(meas.) = 2.63(2) D(calc.) = 2.630 Easily soluble in dilute HCl.

Optical Properties: Transparent. *Color*: Colorless to light brown. *Streak*: White. Luster: Vitreous. *Optical Class*: Biaxial (-). $\alpha = 1.561(2)$ $\beta = 1.580(2)$ $\gamma = 1.581(2)$ 2V(meas.) = 55(5)° 2V(calc.) = 25.6° *Dispersion*: $r < v$, moderate. *Orientation*: $Y = b$, $X \wedge c = 18°$ (in obtuse β).

Cell Data: *Space Group*: $P2_1/c$. $a = 8.5822(3)$ $b = 13.1770(6)$ $c = 20.3040(14)$ $\beta = 98.485(7)°$ $Z = 4$

X-ray Powder Pattern: Foote Lithium mine, Cleveland County, North Carolina, USA.
10.08 (100), 10.98 (43), 3.029 (30), 2.605 (29), 2.543 (24), 4.074 (19), 7.95 (18)

Chemistry:

	(1)	(2)
MnO	25.09	31.59
FeO	7.17	
ZnO	9.75	9.06
Al_2O_3	5.69	5.68
P_2O_5	32.48	31.61
H_2O	[22.72]	22.06
Total	102.90	100.00

(1) Foote Lithium mine, Cleveland County, North Carolina, USA; average electron microprobe analysis supplemented by Raman spectroscopy, H_2O calculated from structure and charge balance; corresponds to $(Mn_{3.09}Fe_{0.87})_{\Sigma=3.96}Zn_{1.05}Al_{0.98}(PO_4)_4(OH)(H_2O)_7 \cdot 3.5H_2O$. (2) $Mn_4ZnAl(PO_4)_4(OH)(H_2O)_7 \cdot 3.5H_2O$.

Occurrence: In solution fractures and small vugs of partially oxidized granite-phosphate pegmatite by late-stage, low-temperature hydrothermal alteration.

Association: Eosphorite, hureaulite, jahnsite-(MnMnMn), kastningite, mangangordonite, metaswitzerite, nizamoffite, stewartite, variscite, whiteite-(CaMnMn).

Distribution: From the Foote Lithium Company mine, Kings Mountain district, Cleveland County, North Carolina, USA.

Name: Honors American mineral collector Jason B. *Smith* (b. 1977) of Charlotte, North Carolina, a specialist in the minerals of the Foote Lithium Company mine, who found the first specimens.

Type Material: Mineral Sciences Department, Natural History Museum of Los Angeles County, Los Angeles, California, USA (74374, 74375 and 74376).

References: (1) Kampf, A.R., A.J. Celestian, and B.P. Nash (2021) Jasonsmithite, a new phosphate mineral with a complex microporous framework, from the Foote mine, North Carolina, U.S.A. Amer. Mineral., 106, 174-179.