Buergerite $\mathbf{NaFe_3^{3+}Al_6(BO_3)_3Si_6O_{18}(O,F,OH)_4}$

Crystal Data: Hexagonal. *Point Group:* $3m$. Crystals short to long prismatic, in divergent sprays, segmented, up to 4 cm, with forms $\{11\bar{2}0\}$, $\{30\bar{3}0\}$, $\{10\bar{1}1\}$, and $\{02\bar{2}1\}$.

Physical Properties: *Cleavage:* Distinct prismatic. *Tenacity:* Brittle. Hardness = 7
D(meas.) = 3.31(1) D(calc.) = 3.29 Pyroelectric and piezoelectric.

Optical Properties: Translucent. *Color:* Dark brown to almost black with a bronze schiller.
Streak: Yellow-brown. *Luster:* Vitreous.
Optical Class: Uniaxial (–). *Pleochroism:* O = yellow-brown; E = very pale yellow.
$\omega = 1.735(3)$ $\epsilon = 1.655(3)$

Cell Data: *Space Group:* $R3m$. $a = 15.869(2)$ $c = 7.188(2)$ $Z = 3$

X-ray Powder Pattern: Mexquitic, Mexico. (ICDD 25-703).
2.563 (100), 2.952 (64), 3.96 (52), 3.47 (48), 6.33 (45), 2.032 (43), 4.20 (40)

Chemistry:

	(1)
SiO_2	33.86
TiO_2	0.55
B_2O_3	10.86
Al_2O_3	30.79
Fe_2O_3	17.62
FeO	1.27
MnO	0.13
MgO	0.13
CaO	0.69
Na_2O	2.46
K_2O	0.07
F	1.86
H_2O^+	0.40
$-O = F_2$	0.78
Total	99.91

(1) Mexquitic, Mexico; corresponds to $(Na_{0.82}Ca_{0.13}K_{0.02})_{\Sigma=0.97}(Fe^{3+}_{2.29}Al_{0.27}Fe^{2+}_{0.18}Ti_{0.07}Mg_{0.03}Mn_{0.02})_{\Sigma=2.86}Al_{6.00}(B_{1.08}O_3)_3Si_{5.85}O_{18}[O_{2.59}F_{1.02}(OH)_{0.46}]_{\Sigma=4.07}$.

Mineral Group: Tourmaline group.

Occurrence: Of probable pneumatolytic origin, in cavities in a rhyolite.

Association: Quartz, potassic feldspar, plagioclase, biotite, muscovite.

Distribution: From near Mexquitic, San Luis Potosi, Mexico.

Name: To honor Professor Martin Julian Buerger (1903–1986), eminent crystallographer, Massachusetts Institute of Technology, Cambridge, Massachusetts, USA.

Type Material: Royal Ontario Museum, Toronto, Canada, M25021; American Museum of Natural History, New York City, New York, 35468; National Museum of Natural History, Washington, D.C., USA, 122200.

References: (1) Donnay, G., C.O. Ingamells, and B. Mason (1966) Buergerite, a new species of tourmaline. Amer. Mineral., 51, 198–199. (2) Tippe, A. and W.C. Hamilton (1971) A neutron diffraction study of the ferric tourmaline, buergerite. Amer. Mineral., 56, 101–113. (3) Dunn, P.J. (1976) Buergerite, uniformity of composition. Amer. Mineral., 61, 1029–1030. (4) Deer, W.A., R.A. Howie, and J. Zussman (1986) Rock-forming minerals, (2nd edition), v. 1B, disilicates and ring silicates, 559–602.