Boggsite **$Ca_8Na_3(Si,Al)_{96}O_{192}\cdot 70H_2O$**

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. Crystals, chisel-shaped, bladed, to 0.5 mm, elongated along [010], showing {011}, {010}, {102}, {001}, and {100}. As radial hemispheres, to 2 mm, composed of fine-grained polycrystalline aggregates.

Physical Properties: *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = ∼3.5 D(meas.) = 1.998 D(calc.) = 1.994 Altered material fluoresces weak bluish under both LW and SW UV.

Optical Properties: Transparent to translucent. *Color:* Colorless to white, due to alteration. *Streak:* White. *Luster:* Vitreous to dull.
Optical Class: Biaxial (–). *Orientation:* $X = c$; $Y = a$; $Z = b$. *Dispersion:* $r > v$, strong.
$\alpha = 1.480(1)$ $\beta = 1.481(1)$ $\gamma = 1.487(1)$ 2V(meas.) = 25(6)°

Cell Data: *Space Group: Imma.* $a = 20.236(2)$ $b = 23.798(1)$ $c = 12.798(1)$ Z = 1

X-ray Powder Pattern: Near Goble, Oregon, USA.
11.269 (100), 3.855 (86), 3.368 (63), 4.456 (34), 11.884 (33), 4.354 (31), 3.604 (31)

Chemistry:

	(1)
SiO_2	63.01
Al_2O_3	12.60
Fe_2O_3	0.11
MgO	0.07
CaO	5.89
Na_2O	1.23
K_2O	0.10
H_2O	17.0
Total	100.01

(1) Near Goble, Oregon, USA; by electron microprobe, H_2O by C-H-N analysis; corresponds to $(Ca_{7.8}Na_{2.9}K_{0.2}Mg_{0.1})_{\Sigma=11.0}(Si_{77.6}Al_{18.3}Fe_{0.1})_{\Sigma=96.0}O_{192}\cdot 70H_2O$.

Mineral Group: Zeolite group.

Occurrence: In vesicles in one of a series of porphyritic basalt flows intercalated with pyroclastics and minor sediments.

Association: Mordenite, tschernichite, zeolites, apophyllite, calcite, aragonite, "opal."

Distribution: Along Goble Creek, near Goble, Columbia Co., Oregon, USA.

Name: After Robert Maxwell Boggs (1918–), of Seattle, Washington, USA, and his son, Dr. Russell Calvin Boggs (1952–), of Cheney, Washington, USA, mineral collectors.

Type Material: American Museum of Natural History, New York, New York, USA; Royal Ontario Museum, Toronto, Canada.

References: (1) Howard, D.G., R.W. Tschernich, J.V. Smith, and G.L. Klein (1990) Boggsite, a new high-silica zeolite from Goble, Columbia County, Oregon. Amer. Mineral., 75, 1200–1204.
(2) Pluth, J.J. and J.V. Smith (1990) Crystal structure of boggsite, a new high-silica zeolite with the first three-dimensional channel system bounded by both 12- and 10-rings. Amer. Mineral., 75, 501–507.