Crawfordite $Na_3Sr(PO_4)(CO_3)$

Crystal Data: Monoclinic. *Point Group:* 2. Irregular anhedral grains, to 1 mm.

Physical Properties: *Fracture:* Conchoidal. Hardness = 3 D(meas.) = 3.05 D(calc.) = 3.08 Bright greenish yellow fluorescence under UV.

Optical Properties: Transparent to translucent. *Color:* Colorless. *Luster:* Vitreous. *Optical Class:* Biaxial (–). *Orientation:* $X \simeq c$; $Y \simeq a$; $Z \simeq b$. $\alpha = 1.520(2)$ $\beta = 1.564(2)$ $\gamma = 1.565(2)$ 2V(meas.) = 20(1)° 2V(calc.) = 17°

Cell Data: *Space Group:* $P2_1$. $a = 9.187(3)$ $b = 6.707(2)$ $c = 5.279(1)$ $\beta = 89.98(3)°$ Z = 2

X-ray Powder Pattern: Khibiny massif, Russia.
2.708 (100), 2.172 (100), 2.648 (90), 1.891 (80), 1.415 (70), 1.129 (60), 1.106 (60)

Chemistry:

	(1)	(2)
P_2O_5	23.64	22.78
CO_2	[14.47]	14.12
CaO	1.45	
SrO	27.42	33.26
Na_2O	31.83	29.84
K_2O	0.22	
Total	[99.03]	100.00

(1) Khibiny massif, Russia; by electron microprobe, average of two analyses, CO_2 from X-ray structural data; corresponding to $Na_{3.03}(Sr_{0.81}Na_{0.10}Ca_{0.08}K_{0.01})_{\Sigma=1.00}(P_{1.01}O_4)(C_{1.00}O_3)$.
(2) $Na_3Sr(PO_4)(CO_3)$.

Occurrence: A hydrothermal mineral in ultra-agpaitic pegmatites in a differentiated alkalic massif.

Association: Pectolite, astrophyllite, barytolamprophyllite, shcherbakovite, vuonnemite, kazakovite, ershovite, chkalovite, natrite, villiaumite, rasvumite, potassian feldspar, nepheline, sodalite, aegirine.

Distribution: From Mt. Koashva, Khibiny massif, Kola Peninsula, Russia.

Name: To honor Adair Crawford (1748–1795), Scottish physician and Professor of Chemistry, discoverer of strontium salts.

Type Material: A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, p1346/1.

References: (1) Khomyakov, A.P., L.I. Polezhaeva, and E.V. Sokolova (1994) Crawfordite $Na_3Sr(PO_4)(CO_3)$: a new mineral from the bradleyite group. Zap. Vses. Mineral. Obshch., 123(3), 41–49 (in Russian with English abs.). (2) (1995) Amer. Mineral., 80, 1328 (abs. ref. 1).