

Crystal Data: Tetragonal. *Point Group:* 4/m. As fine-grained, ~20 nm, crystalline masses in regions between diaplectic plagioclase (maskelynite) and shock-melt pockets.

Physical Properties: *Cleavage:* n.d. *Fracture:* n.d. *Tenacity:* n.d. *Hardness =* n.d. *D(meas.) =* n.d. *D(calc.) =* 3.84(1)

Optical Properties: Transparent. *Color:* Colorless. *Streak:* n.d. *Luster:* n.d.
Optical Class: n.d.

Cell Data: *Space Group:* I4/m. *a =* 9.255(1) *c =* 2.742(3) *Z =* 2

X-ray Powder Pattern: Martian meteorite NWA (Northwest Africa) 856.
Pattern similar to the calculated diffraction pattern of liebermannite.

Chemistry:	(1)
SiO ₂	55.47
TiO ₂	0.06
Al ₂ O ₃	28.25
Cr ₂ O ₃	0.04
Fe ₂ O ₃	0.83
MnO	0.04
MgO	0.07
CaO	11.46
Na ₂ O	4.19
<u>K₂O</u>	<u>0.27</u>
Total	100.69

(1) Martian meteorite NWA (Northwest Africa) 856; average of 11 electron microprobe analyses; corresponding to (Ca_{0.55}Na_{0.36}K_{0.02})(Al_{1.49}Fe_{0.03})Si_{2.49}O₈.

Polymorphism & Series: A high-pressure polymorph of anorthite.

Occurrence: Limited to shock metamorphic environments with dynamic pressures exceeding 20 GPa at temperatures sufficient to transform shock-compressed Ca-rich plagioclase into the dense structure of stöfflerite and below temperatures for the equilibrium phases zagamiite plus stishovite.

Association: Zagamiite, stishovite.

Distribution: From shergottitic Martian meteorite NWA (Northwest Africa) 856.

Name: Honors Dieter *Stöffler*, former director of the Museum für Naturkunde, Berlin, Germany, for his contributions to the field of shock metamorphism in meteorites and terrestrial impact structures.

Type Material: E. Stolper's Martian Meteorite Collection, Division of Geological and Planetary Sciences, California Institute of Technology, Pasadena, California, USA (polished thin section of NWA 856).

References: (1) Tschauer, O., C. Ma, J.G. Spray, E. Greenberg, and V.B. Prakapenka (2021) Stöfflerite, (Ca,Na)(Si,Al)₄O₈ in the hollandite structure: A new high-pressure polymorph of anorthite from martian meteorite NWA 856. *Amer. Mineral.*, 106, 650-655.