Ahrensite $SiFe_2O_4$

Crystal Data: Cubic. *Point Group*: 4/*m* $\bar{3}$ 2/*m*. In polycrystalline aggregates to 20 μm.

Physical Properties: *Cleavage*: n.d. *Tenacity*: n.d. *Fracture*: n.d. Hardness = n.d.
D(meas.) = n.d. D(calc.) = 4.26

Optical Properties: Translucent. *Color*: Bluish green. *Streak*: n.d. *Luster*: n.d.
Optical Class: n.d.

Cell Data: *Space Group*: *Fd*$\bar{3}$ *m*. *a* = 8.1629(2) Z = 8

X-ray Powder Pattern: Tissint Martian meteorite.
2.461 (100), 1.443 (57), 2.041 (50), 1.571 (20), 1.063 (13), 1.245 (10), 0.943 (10)

Chemistry:

	(1)
SiO_2	34.9
FeO	43.8
MgO	21.1
MnO	0.75
Total	100.55

(1) Tissint Martian meteorite; average electron microprobe analysis supplemented by Raman spectroscopy; corresponds to $(Fe_{1.06}Mg_{0.91}Mn_{0.02})Si_{1.01}O_4$.

Polymorphism & Series: Solid solution series with ringwoodite.

Mineral Group: Spinel supergroup, oxyspinel group.

Occurrence: From the transformation of fayalite-rich rims of olivine megacrysts or Fe-rich microphenocrysts in contact with shock melt pockets in an olivine-phyric shergottite meteorite [TL].

Association: Bridgmanite, ringwoodite, wüstite, stishovite, olivine, ilmenite.

Distribution: In the Tissint Martian meteorite [TL]. Possible terrestrial occurrences are included in the references.

Name: Honors California Institute of Technology geophysicist Thomas J. *Ahrens* (1936-2010) for pioneering and fundamental contributions to high-pressure mineral physics and planetary sciences, many of which involved the interpretation of shock effects in natural rocks and synthetic materials.

Type Material: Meteorite Collection, Frank H. McClung Museum, University of Tennessee, Knoxville, Tennessee, USA.

References: (1) Ma, C., O. Tschauner, J.R. Beckett, Y. Liu, G.R. Rossman, S.V. Sinogeikin, J.S. Smith, and L.A. Taylor (2016) Ahrensite, γ-Fe_2SiO_4, a new shock-metamorphic mineral from the Tissint meteorite: Implications for the Tissint shock event on Mars. Geochimica et Cosmochimica Acta, 184, 240-256. (2) Glassley, W.E., J.A. Korstgård, and K. Sørensen (2016) Further observations related to a possible occurrence of terrestrial ahrensite. Amer. Mineral., 101, 2347-2350. (3) Díaz-Martinez, E. and J. Ormö (2003) An alternative hypothesis for the origin of ferroan ringwoodite [ahrensite] in the pumice of El Gasco (Cáceres, Spain). Lunar and Planetary Science, XXXIV, 1318.