Meridianiite $Mg(SO_4)\cdot 11H_2O$

Crystal Data: Triclinic. *Point Group*: $\bar{1}$. As platy crystals with tapered edges to 20 μm.

Physical Properties: *Fracture*: n.d. Hardness = n.d. D(meas.) = n.d. D(calc.) = 1.507
Stable < 2 °C; above 2 °C, it melts incongruently to a slurry of epsomite and water.

Optical Properties: Transparent to translucent. *Color*: Colorless. *Luster*: n.d.
Optical Class: n.d. n = 1.418-1.448

Cell Data: *Space Group*: $P\bar{1}$. a = 6.7459 b = 6.8173 c = 17.280 α = 88.137° β = 89.481° γ = 62.719° Z = 2

X-ray Powder Pattern: Basque claims, near Ashcroft, central British Columbia, Canada. Diffractogram published in reference (1).

Chemistry: Micro-Raman spectroscopy confirms composition of natural material compared to synthetic.

Occurrence: In a pocket near the surface of a frozen pond that allowed evaporation, concentration of dissolved matter, and crystallization at temperatures well below the freezing point of water. In sea ice inclusions and Antarctic ice.

Association: Ice.

Distribution: From the Basque claims, near Ashcroft, central British Columbia, Canada. Found in inclusions in sea ice from Saroma Lake, northeastern shore of Hokkaido Island, ~30 km from Abashiri City, Japan and at Dome Fuji Station, East Antarctica at the 3810 m asl summit of the East Dronning Maud Land Plateau.

Name: For the locality where the Mars Exploration Rover (MER) Opportunity observed crystal molds in sedimentary rock that may be caused by minerals that have since dehydrated or dissolved.

Type Material: Canadian Museum of Nature, Ottawa, Ontario, Canada.

References: (1) Peterson, R.C., W. Nelson, B. Madu, and H.F. Shurvell (2007) Meridianiite: A new mineral species observed on Earth and predicted to exist on Mars. Amer. Mineral., 92, 1757-1759.
(2) Peterson, R.C. and R. Wang (2006) Crystal molds on Mars: Melting of a possible new mineral species to create Martian chaotic terrain. Geology, 34, 957-960.