Ice

Crystal Data: Hexagonal or cubic (ice-VII). Point Group: $6/m 2/m 2/m$ or $2/m 3$. Crystals hexagonal, prismatic, to 0.5 m; as "snow" crystals, stellate, skeletal, flattened on [0001]; as "hail", rounded and concentrically zoned; stalactitic, compact, massive; as "frost", columnar, arborescent, feathery. Twinning: On {0001}; glides on {0001}.

Physical Properties: Fracture: Conchoidal. Tenacity: Brittle. Hardness = 1.5 D(meas.) = 0.9167 D(calc.) = [0.93] A liquid above 0 °C; diamagnetic.


Optical Class: Uniaxial (+). $\omega = 1.30907$ $\epsilon = 1.31052$

Cell Data: Space Group: $P6_{3}/mmc$. $a = 4.498$ $c = 7.338$ Z = 4 or $Pn\overline{3} m$ (ice-VII). $a = 3.163$

X-ray Powder Pattern: Synthetic.
3.90 (100), 3.66 (100), 2.25 (90), 3.4 (80), 2.07 (60), 1.92 (50), 2.67 (35)

X-ray Powder Pattern: Ice-VII.
2.237 (100), 1.291 (23), 1.582 (11), 0.845 (8), 1.118 (7), 1.000 (7), 0.913 (2)

Chemistry: H$_2$O of varying degrees of purity.

Polymorphism & Series: High pressure polymorphs include ice-VI and ice-VII.

Occurrence: Formed at low temperatures by sublimation in the atmosphere and in layers over open bodies of water; in glacial flows and thick masses of near-continental dimensions. Ice-VII as inclusions in diamonds indicates the presence of aqueous fluid in the mantle transition zone and in its boundary with the lower mantle.

Association: None.

Distribution: Worldwide; especially in polar icecaps and glaciers; as inclusions in diamonds.

Name: From Middle English is, iis, in turn from Old English is.