Gibbsite  \( \text{Al(OH)}_3 \)

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Crystal Data:  Monoclinic.  \( \text{Point Group: } 2/m. \)  As pseudohexagonal crystals, tabular on \( \{001\} \), with \( \{101\}, \{110\} \), to 3 cm.  Also as lamellar or acicular aggregates, stalactitic, or mamillary; in enamellike coatings, compact earthy.  \( \text{Twinning: } \) Common on \( \{001\} \), less common on \( \{100\} \) and \( \{110\} \); also very common about \( [130] \) with \( \{001\} \) of the individuals in parallel.

Physical Properties:  \( \text{Cleavage: } \) \{001\}, perfect.  \( \text{Tenacity: } \) Tough.  \( \text{Hardness} = 2.5–3.5 \)

\( \text{D(meas.)} = 2.40 \)  \( \text{D(calc.)} = [2.42] \)  Strong argillaceous odor when breathed upon.

Optical Properties:  \( \text{Color: } \) Colorless, white, gray, pale green, pale red; colorless to brownish in thin section.  \( \text{Luster: } \) Vitreous, pearly on cleavage surfaces, dull in aggregates.

\( \text{Optical Class: } \) Biaxial (+).  \( \text{Orientation: } X = b; \ Y \wedge a = 25.5^\circ; \ Z \wedge c \simeq -21^\circ. \)

\( \text{Dispersion: } r > v, \text{strong}; \text{sometimes } v > r. \quad \alpha = 1.56–1.58 \quad \beta = 1.56–1.58 \quad \gamma = 1.58–1.60 \)

\( 2V(\text{meas.}) = 0°–40° \)

Cell Data:  \( \text{Space Group: } P2_1/n. \quad a = 8.684(1) \quad b = 5.078(1) \quad c = 9.736(2) \quad \beta = 94.54(1)^\circ \)

\( Z = 8 \)


(100) 4.853 (100), 4.380 (36), 4.328 (18), 2.389 (16), 2.456 (12), 2.052 (12), 1.8074 (10)

Chemistry:

\[
\begin{array}{c|cc|cc}
\text{SiO}_2 & 1.03 & \text{MgO} & \text{trace} \\
\text{Al}_2\text{O}_3 & 64.92 & 65.36 & \text{CaO} & 0.17 \\
\text{Fe}_2\text{O}_3 & \text{trace} & \text{H}_2\text{O} & 34.12 & 34.64 \\
\hline
\text{Total} & 100.24 & 100.00
\end{array}
\]

(1) Klein-Tresny, Moravia.  (2) \( \text{Al(OH)}_3 \).

Polymorphism & Series:  Polymorphous with bayerite, doyleite, and nordstrandite.

Occurrence:  A typical product of weathering of aluminous minerals, common in lateritic soils and bauxite.  Also formed in low-temperature hydrothermal and metamorphic environments, replacing aluminous minerals.

Association:  Diaspore, böhmite, corundum, kaolinite, goethite.

Distribution:  Widespread, particularly in bauxite deposits.  Some prominent localities are:  in the USA, at Richmond, Berkshire Co., Massachusetts; Unionville, Chester Co., Pennsylvania; large crystals from the Champion mine, White Mountains, Mono Co., California; from Toomsboro, Wilkinson Co., Georgia; at Tar Branch, near Winston-Salem, Forsyth Co., North Carolina.  Around Saramenha, Ouro Prêto, Minas Gerais, Brazil.  From Paramaribo, Surinam.  On Eikaholmen and Lille-Arø Islands, Langesundsford, and at Tredalen, near Larvik, Norway.  Large crystals from Schischimskaya, near Zlatoust, Ural Mountains, Russia.  On the Vogelsberg, Hesse, and on the Katzenbuckel, Baden-Württemberg, Germany.  In India, many localities, as at Kodikanal, Madras, and Talevadi, near Bombay, Maharashtra.  From Dundas, Tasmania, Australia.

Name:  Honors Colonel George Gibbs (1776–1833), a prominent mineral collector of New Haven, Connecticut, USA.

Type Material:  n.d.


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