

# Wegscheiderite

# Na<sub>5</sub>(HCO<sub>3</sub>)<sub>3</sub>(CO<sub>3</sub>)

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**Crystal Data:** Triclinic. *Point Group:*  $\bar{1}$ . Acicular to bladed subhedral to anhedral crystals, to 5 cm, and commonly fibrous, in aggregates.

**Physical Properties:** *Cleavage:* Prismatic, distinct. *Fracture:* Uneven to subconchoidal. Hardness = 2.5–3 D(meas.) = 2.341 D(calc.) = 2.334 Soluble in H<sub>2</sub>O.

**Optical Properties:** Semitransparent. *Color:* Colorless. *Luster:* Vitreous. *Optical Class:* Biaxial (-). *Dispersion:*  $r < v$ .  $\alpha = 1.433$   $\beta = 1.519(2)$   $\gamma = 1.528$   $2V(\text{meas.}) = 32.4^\circ$   $2V(\text{calc.}) = 34^\circ$

**Cell Data:** *Space Group:*  $P\bar{1}$ .  $a = 10.04(3)$   $b = 15.56(4)$   $c = 3.466(10)$   $\alpha = 91^\circ55(5)'$   $\beta = 95^\circ49(5)'$   $\gamma = 108^\circ40(5)'$   $Z = 2$

**X-ray Powder Pattern:** Grierson Well No. 1, Wyoming, USA. 2.954 (100b), 3.68 (60), 2.642 (60), 2.214 (60), 2.793 (50), 2.662 (42), 2.831 (35)

Chemistry:	(1)	(2)
CO <sub>2</sub>	46.60	49.17
Na <sub>2</sub> O	43.40	43.28
H <sub>2</sub> O <sup>+</sup>	10.00	7.55
Total	[100.00]	100.00

(1) Green River Formation, Wyoming, USA; here recalculated to a conventional oxide analysis from an elemental analysis including direct determinations of (CO<sub>3</sub>)<sup>2-</sup> and (HCO<sub>3</sub>)<sup>1-</sup>, totalling 99.75%, after deduction of Cl 0.06%, H<sub>2</sub>O<sup>-</sup> 0.36%, organic 4.38%. (2) Na<sub>5</sub>(HCO<sub>3</sub>)<sub>3</sub>(CO<sub>3</sub>).

**Occurrence:** As a replacement of trona in a lacustrine deposit.

**Association:** Trona, halite.

**Distribution:** In the USA, in the Green River Formation, from the Perkins Well No. 1, the Perkins Well No. 2, about 10 km west, and as large crystals in the Grierson Well No. 1, about 20 km northwest, Sweetwater Co., Utah; in the Piceance Basin, Garfield and Rio Blanco Cos., Colorado. From the Biyang Basin, Henan Province, China.

**Name:** In honor of Rudolf Franz Johann Wegscheider (1859–1935), Austrian chemist, who first synthesized the compound.

**Type Material:** National Museum of Natural History, Washington, D.C., USA, 117710.

**References:** (1) Fahey, J.J. and K.P. Yorks (1963) Wegscheiderite (Na<sub>2</sub>CO<sub>3</sub>•3NaHCO<sub>3</sub>), a new saline mineral from the Green River Formation, Wyoming. *Amer. Mineral.*, 48, 400–403. (2) Appleman, D.E. (1963) X-ray crystallography of wegscheiderite (Na<sub>2</sub>CO<sub>3</sub>•3NaHCO<sub>3</sub>). *Amer. Mineral.*, 48, 404–406. (3) Fernandes, N.G., R. Tellgren, and I. Olovsson (1990) Structure and electron density of pentasodium trihydrogentetracarbonate. *Acta Cryst.*, 46, 466–474.