Chabazite-Ca $Ca_2[Al_4Si_8O_{24}]\cdot 13H_2O$

Crystal Data: Pseudohexagonal. *Point Group*: $\bar{3}$ 2/*m*. Crystals rhombohedral, nearly equant, to 4.5 cm; tabular, complex to rounded twins; anhedral, granular, or massive. *Twinning*: About [00*1], interpenetrant, simple and repeated, common; contact on {10*1}.

Physical Properties: *Cleavage*: {10*1}, distinct. *Fracture*: Uneven. *Tenacity*: Brittle.
Hardness = 4-5 D(meas.) = 2.05-2.20 D(calc.) = 2.035

Optical Properties: Transparent to translucent. *Color*: White, yellow, pink, red, colorless; colorless in thin section. *Streak*: White. *Luster*: Vitreous.
Optical Class: Biaxial (+) or (-) or uniaxial; commonly shows birefringent panelling in six sections.
Orientation: $X = c$; rarely $Z = c$. α = 1.478-1.487 β = n.d. γ = 1.480-1.493 2V(meas.) = 0°-32°

Cell Data: *Space Group*: $R\bar{3}\,m$. a = 13.790(5) c = 15.040(4) [pseudohexagonal cell, with composition $(Ca_{1.86}Na_{0.03}K_{0.20}Mg_{0.02}Sr_{0.03})[Al_{3.94}Fe_{0.01}Si_{8.03}O_{24}]\cdot 13.16H_2O$] Z = 1

X-ray Powder Pattern: Table Mountain, Colorado, USA.
2.925 (100), 4.32 (75), 9.35 (50), 5.02 (30), 3.87 (30), 2.890 (30), 3.59 (25)

Chemistry:

	(1)	(2)		(1)	(2)
SiO_2	47.56	46.63	K_2O	0.92	
Al_2O_3	20.40	19.77	H_2O^+	16.28	
MgO	0.20		H_2O^-	3.44	
CaO	10.52	10.88	H_2O		22.72
Na_2O	0.32		Total	99.64	100.00

(1) Ritter Hot Spring, Grant Co., Oregon, USA; corresponds to $(Ca_{1.88}K_{0.20}Na_{0.10}Mg_{0.04})_{\Sigma=2.22}Al_{4.02}Si_{7.94}O_{24}\cdot 11H_2O$. (2) $Ca_2Al_4Si_8O_{24}\cdot 13H_2O$.

Mineral Group: Zeolite group, chabazite series.

Occurrence: In volcanic rocks as basalts, andesite; rarer in limestones and schists; hydrothermally deposited in cavities and joints in ore veins. In tuff in lake deposits, altered from volcanic glass.

Association: Zeolites, nepheline, melilite, olivine, pyroxenes, amphiboles, axinite, epidote, calcite, tridymite, dolomite.

Distribution: A common zeolite. Fine crystals from Idar-Oberstein, Rhineland-Palatinate, Germany. At Řepčice (Rübendörfel), near Ústí nad Lábem (Aussig), Czech Republic. At several localities in Co. Antrim, Ireland. In Scotland, at Kilmalcolm, Renfrewshire. From Haeddin, on Eysturoy; Dalsnipa, on Sandoy; and Skutin, on Nolsoy, Faeroe Islands. Large crystals at Breidhdalsheidhi, Iceland. In the USA, around Paterson, Passaic Co., and Bergen Hill, Hudson Co., New Jersey; on Table Mountain, Jefferson Co., Colorado; at Goble, Columbia Co., and Springfield, Lane Co., Oregon. In the Bay of Fundy district, Nova Scotia, Canada. On Table Mountain, Rosarito Beach, Baja California, Mexico. In the Khandivali quarry, near Bombay, Maharashtra, India. At Richmond and Collingwood, Victoria, and Fairy Mount, near Kyogle, New South Wales, Australia.

Name: From the Greek *chabazios*, an ancient name of a stone. A suffix indicates the most abundant extra-framework cation. Chabazite is the correct name for a member of the chabazite series that is not specifically identified on compositional grounds.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 589-592. (2) Deer, W.A., R.A. Howie, and J. Zussman (1963) Rock-forming minerals, v. 4, 387-400. (3) Passaglia, E. (1970) The crystal chemistry of chabazites. Amer. Mineral., 55, 1278-1301. (4) Gude, A.J., 3rd and R.A. Sheppard (1966) Silica-rich chabazite from the Barstow Formation, San Bernardino County, Southern California. Amer. Mineral., 51, 909-915. (5) Mazzi, F. and E. Galli (1983) The tetrahedral framework of chabazite. Neues Jahrb. Mineral., Monatsh., 461-480. (6) Gualtieri, A.F. and E. Passaglia (2006) Rietveld structure refinement of NH_4-exchanged natural chabazite. Eur. J. Mineral., 18, 351-359. (7) Coombs, D.S., and others (1998) Recommended nomenclature for zeolite minerals: Report of the Subcommittee on Zeolites of the IMA, Commission on New Mineral and Mineral Names. Mineral. Mag., 62, 533-571.