Chamosite $(Fe^{2+}, Mg, Fe^{3+})_5Al(Si_3Al)O_{10}(OH, O)_8$

Crystal Data: Monoclinic. *Point Group:* $2/m$. In scaly aggregates, foliated or granular; oolitic, made up of very minute radiating crystals; massive. *Twinning:* Twin and composition plane {001}, axis [310].

Physical Properties: *Cleavage:* {001}, perfect. *Tenacity:* Somewhat flexible but inelastic. Hardness = 2–3 D(meas.) = 3.0–3.4 D(calc.) = 3.129 Weakly magnetic.

Optical Properties: Translucent to almost opaque. *Color:* Green, greenish grey, black, brown; in thin section, colorless, yellowish, green. *Streak:* Green to gray. *Luster:* Pearly. *Optical Class:* Biaxial (–). *Pleochroism:* Weak to moderate; X = yellow-green to light brownish green; $Y = Z$ = green to dark green. *Orientation:* $Y = b$; $X \wedge a = 88°–90°$; $Z \wedge a = 0°–2°$: or rarely $Y = b$; $X \wedge a \simeq 0°$; $Z \wedge a \simeq 90°$. *Dispersion:* $r < v$, strong. *Absorption:* $Y \simeq Z > X$; rarely $X \simeq Y > Z$. $\alpha = 1.595–1.671$ $\beta = 1.599–1.684$ $\gamma = 1.599–1.685$ 2V(meas.) = 0°–30°

Cell Data: *Space Group:* $C2/m$. $a = 5.373$ $b = 9.306$ $c = 14.222$ $\beta = 97°53'$ Z = 2

X-ray Powder Pattern: Hermanovice, Czech Republic. (ICDD 21-1227).
7.05 (100), 3.52 (100), 2.601 (90), 1.551 (90), 2.392 (80), 14.1 (70), 2.554 (70)

Chemistry:

	(1)	(2)		(1)	(2)
SiO_2	26.40	26.65	CaO	0.42	
Al_2O_3	18.23	16.14	Na_2O	0.17	
Fe_2O_3	5.70	6.69	K_2O	0.17	
FeO	25.87	34.43	H_2O^+	10.60	11.42
MnO	0.04		H_2O^-	1.05	0.08
MgO	11.35	4.47	Total	[100.00]	99.88

(1) Wickwar, England; recalculated to 100.00%, total Fe as Fe^{2+} in empirical formula; corresponds to $(Fe^{2+}_{2.82}Mg_{1.84}Ca_{0.05}Na_{0.04}K_{0.02})_{\Sigma=4.77}Al_{1.21}(Si_{2.87}Al_{1.13})_{\Sigma=4.00}O_{10}(OH)_8$.
(2) Schmiedefeld, Germany; total Fe as Fe^{2+} in empirical formula; corresponds to $(Fe^{2+}_{3.87}Mg_{0.76})_{\Sigma=4.63}Al_{1.23}(Si_{3.05}Al_{0.95})_{\Sigma=4.00}O_{10}(OH)_8$.

Polymorphism & Series: Dimorphous with orthochamosite; forms a series with clinochlore.

Mineral Group: Chlorite group.

Occurrence: In sedimentary ironstones; authigenically formed under reducing conditions in the presence of decomposed organic material.

Association: Siderite, kaolinite, quartz, magnetite, pyroxenes, plagioclase, olivine, calcite.

Distribution: Many localities, but careful characterization is necessary. From Chamoson, Valais, and in the Maderantal, Uri, Switzerland. At Hermanovice and Kladno, Czech Republic. From Schmiedefeld, near Suhl, and Schleiz, Thuringia, Germany. In England, at Frodingham, Lincolnshire; Wickwar, Gloucestershire; at Penzance, Cornwall, and elsewhere. At Knowehead, Co. Antrim, Ireland. In the Arakawa mine, Akita Prefecture, and at Shogase, Tokushima Prefecture, Japan. From Creede, Mineral Co., Colorado; near Hot Springs, Garland Co., Arkansas; and in the Beacon Hill mine, Champion, Marquette Co., Michigan, USA. At Wabana, Newfoundland, Canada.

Name: For the locality at Chamoson, Switzerland.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 658.
(2) Deer, W.A., R.A. Howie, and J. Zussman (1963) Rock-forming minerals, v. 3, sheet silicates, 131–163. (3) Bayliss, P. (1975) Nomenclature of the trioctahedral chlorites. Can. Mineral., 13, 178–180.