Christofschäferite-(Ce) \((\text{Ce,La,Ca})_4\text{Mn(Ti,Fe}^{2+})_3(\text{Fe}^{3+},\text{Ti})(\text{Si}_2\text{O}_7)\text{O}_8\)

Crystal Data: Monoclinic. Point Group: \(2/m\). As stubby prismatic crystals or isolated grains to 3 mm.

Physical Properties: Cleavage: None observed. Tenacity: Brittle. Fracture: Conchoidal. Hardness = 6 \(D\) (meas.) = 4.8(1) \(D\) (calc.) = 4.853

Optical Properties: Translucent. Color: Black. Streak: Brown. Luster: Resinous. Optical Class: Biaxial (-). \(\alpha = 1.945(10)\) \(\beta = 2.015(10)\) \(\gamma = 2.050(10)\) \(2\nu\) (meas.) = 70(10)° \(2\nu\) (calc.) = 68° Pleochroism: Strong; very dark brown to light brown. Absorption: \(Z > Y > X\)

Cell Data: Space Group: \(P2_1/m\). \(a = 13.3722(4)\) \(b = 5.7434(1)\) \(c = 11.0862(2)\) \(\beta = 100.580(2)°\) \(Z = 2\)

X-ray Powder Pattern: Wingertsbergwand, Eifel Mountains, Rhineland-Palatinate, Germany. 2.730 (100), 3.169 (81), 3.480 (78), 4.64 (65), 2.169 (46), 1.737 (46), 3.095 (43), 4.90 (39)

Chemistry:

\[
\begin{align*}
\text{CaO} & = 2.61 \\
\text{La}_2\text{O}_3 & = 19.60 \\
\text{Ce}_2\text{O}_3 & = 22.95 \\
\text{Pr}_2\text{O}_3 & = 0.56 \\
\text{Nd}_2\text{O}_3 & = 2.28 \\
\text{MgO} & = 0.08 \\
\text{MnO} & = 4.39 \\
\text{FeO} & = 4.18 \\
\text{Fe}_2\text{O}_3 & = 3.11 \\
\text{Al}_2\text{O}_3 & = 0.08 \\
\text{Ti}_2\text{O}_5 & = 19.02 \\
\text{Nb}_2\text{O}_5 & = 0.96 \\
\text{Si}_2\text{O}_7 & = 9.38 \\
\text{Total} & = 99.20
\end{align*}
\]

(1) Wingertsbergwand, Eifel Mountains, Rhineland-Palatinate, Germany; average of 5 electron microprobe analyses, \(\text{Fe}^{2+}:\text{Fe}^{3+} = 3:2\), from structural analysis, corresponds to \((\text{Ce}_{1.72}\text{La}_{1.48}\text{Nd}_{0.17}\text{Pr}_{0.04}\text{Ca}_{0.57})\Sigma = 3.98\text{Mn}^{2+}\text{Fe}^{3+}\text{Al}_{0.02}\text{Ti}_{2.935}\text{Fe}^{3+}\text{Nd}_{0.09}\text{Si}_{3.98}\text{O}_{22}\).

Mineral Group: Chevkinite group.

Occurrence: A metasomatic reaction product between Mn-rich rock and alkali basalt, found in a volcanic ejectum.

Association: Orthoclase, rhodonite, bustamite, tephroite, zircon, fluorapatite, pyrophanite, jacobsite.

Distribution: From Wingertsbergwand (Wingertsberg Mt.) of the Laacher See volcano near Mendig, Eifel Mountains, Rhineland-Palatinate (Rhineland-Pfalz), Germany.

Name: Honors Christof Schäfer (b. 1961), a German mineral collector, who collected the first specimens.

Type Material: A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia; 4227/1.