Esseneite

Crystal Data:  Monoclinic.  Point Group:  2/m.  As prismatic crystals, up to 8 mm.

Physical Properties:  Cleavage:  Perfect on {110}.  Hardness = 6  D(meas.) = n.d.

D(calc.) = 3.54

Optical Properties:  Transparent in thin crystals.  Color:  Reddish brown, becoming darker

Optical Class:  Biaxial (-).  Pleochroism:  X = lemon-yellow; Y = greenish yellow; Z =
apple-green.  Orientation:  Y = b; Z \( \wedge c = 9^\circ \).  Dispersion:  \( r < v \), strong.  \( \alpha = 1.795(5) \)
\( \beta = 1.815(5) \)  \( \gamma = 1.825(5) \)  \( 2V(\text{meas.}) = 77(5)^\circ \)

Cell Data:  Space Group:  \( C2/c \).  \( a = 9.79(1) \)  \( b = 8.822(9) \)  \( c = 5.37(1) \)  \( \beta = 105.81(9)^\circ \)

Z = 4

X-ray Powder Pattern:  Durham ranch, Wyoming, USA.
3.000 (100), 2.526 (70), 2.960 (60), 2.554 (40), 2.576 (30), 1.545 (30), 1.430 (25)

Chemistry:

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\begin{align*}
\text{SiO}_2 & \quad 29.51 \\
\text{TiO}_2 & \quad 0.99 \\
\text{Al}_2\text{O}_3 & \quad 17.95 \\
\text{Fe}_2\text{O}_3 & \quad 23.89 \\
\text{FeO} & \quad 0.69 \\
\text{MnO} & \quad 0.11 \\
\text{MgO} & \quad 2.68 \\
\text{CaO} & \quad 23.40 \\
\text{Na}_2\text{O} & \quad 0.14 \\
\text{Total} & \quad 99.36
\end{align*}
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(1) Durham ranch, Wyoming, USA; by electron microprobe, average of 43 analyses on several
grains, Fe\(^{2+}\):Fe\(^{3+}\) calculated from normalized formula; corresponds to \((\text{Ca}_{1.01}\text{Na}_{0.01})\Sigma=1.02
(\text{Fe}_{0.72}\text{Mg}_{0.16}\text{Al}_{0.04}\text{Ti}_{0.03}\text{Fe}_{0.02})\Sigma=0.97(\text{Si}_{1.19}\text{Al}_{0.81})\Sigma=2.00\text{O}_6\).

Mineral Group:  Pyroxene group.

Occurrence:  A high-temperature, low-pressure, oxidized and quenched crystallization product
derived from fused sediments contiguous to naturally combusted coal seams.

Association:  Anorthite, melilite, magnetite-hercynite, glass.

Distribution:  At Durham ranch, in the Powder River basin, 13 km northeast of Reno Junction
and 25 km south of Gillette, Campbell Co., Wyoming, USA.

Name:  For Dr. Eric J. Essene, Professor at the University of Michigan, Ann Arbor, Michigan,
USA, and discoverer of the first specimens.


(CaFe\(^{3+}\)AlSiO\(_6\)), a new pyroxene produced by pyrometamorphism. Amer. Mineral., 72, 148–156.