Nelenite $(Mn^{2+},Fe^{2+})_{16}As_3^{3+}Si_{12}O_{36}(OH)_{17}$

Crystal Data: Hexagonal. *Point Group:* $\bar{3}\,2/m$. Coarse granular, to 4.5 cm; massive.

Physical Properties: *Cleavage:* {0001}, perfect. Hardness = ~5 D(meas.) = 3.46 D(calc.) = 3.44–3.45

Optical Properties: Transparent. *Color:* Light to medium brown; in transmitted light, colorless to light brown. *Streak:* Light brown. *Luster:* Vitreous on cleavages, resinous and duller on fractures.
Optical Class: Uniaxial (–); may appear biaxial. *Pleochroism:* O = light brown; E = colorless. $\omega = 1.718(4)$ $\epsilon = 1.700(4)$ 2V(meas.) = 0°

Cell Data: *Space Group:* $R\bar{3}m$. $a = 13.418(5)$ $c = 85.48(8)$ Z = [2]

X-ray Powder Pattern: Franklin, New Jersey, USA.
2.552 (100), 2.878 (70), 3.55 (60), 1.677 (60), 1.723 (50), 7.10 (40), 2.402 (40)

Chemistry:

	(1)	(2)
SiO_2	31.12	30.8
As_2O_3	12.46	13.2
FeO	17.12	17.8
MnO	29.22	28.1
ZnO	3.63	2.6
MgO	0.12	0.5
CaO		0.4
H_2O	6.42	[6.6]
Total	100.00	[100.0]

(1) Franklin, New Jersey, USA; corresponds to $(Mn_{9.54}Fe_{5.51}Zn_{1.04}Mg_{0.07})_{\Sigma=16.16}$ $As_{2.92}Si_{12}O_{36.28}(OH)_{16.52}$. (2) Do.; by electron microprobe, H_2O by difference; corresponds to $(Mn_{9.27}Fe_{5.80}Zn_{0.75}Mg_{0.29}Ca_{0.17})_{\Sigma=16.28}As_{3.12}Si_{12}O_{36.39}(OH)_{17.14}$.

Polymorphism & Series: Dimorphous with schallerite.

Occurrence: In a metamorphosed stratiform zinc deposit, within pegmatitic textured masses, and as calcite-cemented fragments in a breccia probably derived from the pegmatitic material.

Association: Actinolite, calcite, willemite, tirodite, rhodonite, apatite, lennilenapeite, stilpnomelane, microcline, talc.

Distribution: From Franklin, Sussex Co., New Jersey, USA.

Name: In honor of Joseph A. Nelen, chemist at the Smithsonian Institution, Washington, D.C., USA.

Type Material: Harvard University, Cambridge, Massachusetts, 92791; National Museum of Natural History, Washington, D.C., USA, R7824, C6219, 145972; The Natural History Museum, London, England, 1983,237.

References: (1) Dunn, P.J. and D.R. Peacor (1984) Nelenite, a manganese arsenosilicate of the friedelite group, polymorphous with schallerite, from Franklin, New Jersey. Mineral. Mag., 48, 271–275. (2) (1985) Amer. Mineral., 70, 874–875 (abs. ref. 1).