Milanriederite $(Ca, REE)_{19}Fe^{3+}Al_4(Mg, Al, Fe^{3+})_8Si_{18}O_{68}[(OH, O]_{10}$

Crystal Data: Tetragonal. *Point Group*: 4/*m* 2/*m* 2/*m*. As dipyramidal crystals to 3 mm that display{111}, {001}, {110}, and {100}.

Physical Properties: *Cleavage*: None. *Tenacity*: Brittle. *Fracture*: Uneven. Hardness = 6
D(meas.) = 3.53(2) D(calc.) = 3.547 Nonfluorescent.

Optical Properties: Transparent. *Color*: Dark brownish red. *Streak*: n.d. *Luster*: Vitreous.
Optical Class: Uniaxial (-). ω = 1.744(3) ε = 1.737(3) *Pleochroism*: *O* = brownish pink, *E* = nearly colorless.

Cell Data: *Space Group: P*4/*nnc*. *a* = 15.6578(4) *c* = 11.8597(5) Z = 2

X-Ray Diffraction Pattern: Kombat mine, Grootfontein district, Otjozondjupa region, Namibia.
2.774 (100), 2.617 (87), 2.970 (50), 1.628 (38), 2.481 (30), 2.143 (19), 1.676(17)

Chemistry:

	(1)
Na_2O	0.47
MgO	5.49
CaO	29.86
Mn_2O_3	1.40
Al_2O_3	9.75
Fe_2O_3	6.03
Y_2O_3	2.44
La_2O_3	4.43
Ce_2O_3	0.86
Pr_2O_3	0.32
Nd_2O_3	1.31
SiO_2	34.84
H_2O	2.9
Total	100.10

(1) Kombat mine, Grootfontein district, Namibia; average electron microprobe, Mössbauer and FTIR spectroscopic analyses, H_2O by gas chromatography; corresponds to $[Ca_{16.48}(La_{0.84}Y_{0.67}Ce_{0.16}Nd_{0.24}Pr_{0.06})_{\Sigma=1.97}Na_{0.47}]_{\Sigma=18.92}Al_4(Mg_{4.22}Fe^{3+}_{2.34}Al_{1.92}Mn^{3+}_{0.55})_{\Sigma=9.03}Si_{17.95}O_{68.04}(OH)_{9.96}$.

Mineral Group: Vesuvianite group. Analogue of vesuvianite with Mg predominant at the *Y3* site.

Occurrence: By hydrothermal and metasomatic replacement and fracture-filling of dolostones.

Association: Baryte, calcite, jacobsite, hausmannite, glaucochroite, native copper.

Distribution: From the Kombat mine, Grootfontein district, Otjozondjupa region, Namibia.

Name: Honors Czech mineralogist Professor *Milan Rieder* (b. 1940), for his contributions to mineralogy and service to the international mineralogical community.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (5224/1).

References: (1) Chukanov, N.V., T.L. Panikorovskii, A.G. Goncharov, I.V. Pekov, D.I. Belakovskiy, S.N. Britvin, S. Möckel, and S.A. Vozchikova (2019) Milanriederite, $(Ca,REE)_{19}Fe^{3+}Al_4(Mg,Al,Fe^{3+})_8Si_{18}O_{68}(OH,O)_{10}$, a new vesuvianite-group mineral from the Kombat Mine, Namibia. Eur. J. Mineral., 31, 637-646.