Liudongshengite $Zn_4Cr_2(OH)_{12}(CO_3)\cdot 3H_2O$

Crystal Data: Hexagonal. *Point Group*: $\bar{3}$ 2/*m*. As micaceous aggregates or platy hexagonal crystals to 0.10 mm.

Physical Properties: Cleavage: Perfect on (0001). *Tenacity*: Brittle. *Fracture*: n.d. Hardness = 1.5 D(meas.) = 2.95(3) D(calc.) = 3.00

Optical Properties: Transparent. *Color*: Pinkish. *Streak*: White. *Luster*: Vitreous. *Optical Class*: Uniaxial (-). ω = 1.720(8) ε = 1.660(7) *Pleochroism*: Weak, *O* = pale pink, *E* = colorless.

Cell Data: *Space Group*: $R\bar{3}\ m$. a = 3.1111(4) c = 22.682(3) Z = 3/6

X-ray Powder Pattern: 79 mine, Hayden area, Banner District, Gila Co., Arizona, USA. 2.62 (100), 2.31 (83), 3.77 (64), 1.952 (48), 7.53 (46), 1.555 (42), 1.523 (32)

Chemistry:

	(1)	(2)
ZnO	38.78	47.62
Cr_2O_3	28.72	22.23
MgO	1.02	
CO_2	8.33	6.44
H_2O	[23.78]	23.71
Total	100.63	100.00

(1) 79 mine, Hayden area, Banner District, Gila Co., Arizona, USA; average electron microprobe and Raman spectroscopic analyses, C by elemental combustion system with mass spectrometer expressed as CO_2, H_2O added to the ideal value; corresponds to $(Zn_{3.25}Mg_{0.17}Cr_{2.58})_{\Sigma=6.00}(OH)_{12}(CO_3)_{1.29}\cdot 3H_2O$. (2) $Zn_4Cr_2(OH)_{12}(CO_3)\cdot 3H_2O$.

Mineral Group: Hydrotalcite supergroup, quintinite group. Cr-analogue of zaccagnaite-3*R*.

Occurrence: In a highly oxidized quartz-sulfide vein in a Pb-Zn mine.

Association: Cerussite, galena.

Distribution: From the 4th level of the 79 mine, Chilito, Hayden area, Banner District, Dripping Spring Mountains, Gila Co., Arizona, USA.

Name: Honors Chinese geologist and archaeologist Professor *Liu Dongsheng* (1917-2008), a Research Fellow at the Institute of Vertebrate Paleontology and Paleoanthropology and then at the Institute of Geology and Geophysics, Chinese Academy of Sciences.

Type Material: University of Arizona Mineral Museum, Tucson, Arizona, USA (22043 holotype) and the RRUFF Project (R180016 cotype).

References: (1) Yang, H., R.B. Gibbs, C. Schwenk, X. Xie, X. Gu, R.T. Downs, and S.H. Evans (2021) Liudongshengite, $Zn_4Cr_2(OH)_{12}(CO_3)\cdot 3H_2O$, a new mineral of the hydrotalcite supergroup, from the 79 mine, Gila County, Arizona, USA. Can. Mineral., 59, 763-769.