*American Mineralogist, Volume 103, pages 143–150, 2018*

# Leesite, $K(H_2O)_2[(UO_2)_4O_2(OH)_5]\cdot 3H_2O$, a new K-bearing schoepite-family mineral from the Jomac mine, San Juan County, Utah, U.S.A.

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## Abstract

Leesite (IMA2016-064), $K(H_2O)_2[(UO_2)_4O_2(OH)_5]\cdot 3H_2O$, is a new uranyl-oxide hydroxyl-hydrate found underground in the Jomac mine, Brown's Rim, White Canyon mining district, San Juan County, Utah. Laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS) analyses provided the empirical formula $K_{0.67}Na_{0.004}Ca_{0.012}U_4O_{20}H_{15.31}$, based on 4 U and 20 O apfu. Sheets in the crystal structure of leesite adopt the fourmarierite anion topology, and so belong to the schoepite family of related structures that differ in the interlayer composition and arrangement, and charge of the sheet. Leesite may form as one of the principal components of "gummite" mixtures formed during the alteration of uraninite, and the unit cell of leesite resembles the previously described, but poorly understood mineral, paraschoepite. Uptake of dangerous radionuclides ($^{90}Sr$, $^{135}Cs$, $^{137}Cs$, $^{237}Np$, $^{238}Pu$) into the structure of leesite and other members of the family has important implications for the safe disposal of nuclear waste.

**Keywords:** Leesite, sheet anion topology, schoepite, uranium, uraninite, crystal structure