

Lava tube mineralogy, Medicine Lake Volcano, California

Bruce Rogers (USGS, ret.)
Western Cave Conservancy,
PO Box 230
Newcastle, CA 95658

Medicine Lake Volcano is located in northeastern California at an elevation of about 2680 m. It is the largest Cascadian volcano in volume. Lavas ranging from 2Ma to about 900 years old carpet the volcano. Within Lava Beds National Monument, the Basalt of Mammoth Crater (~36,000 ybp) and the Valentine Flow (~12,500 ybp) are the two major lava tube flows. The 12,500-year old Giant Crater flow and Burnt Lava Flow (2,950 ybp) on the southern side of the volcano are also a major lava tube producing flow.

Seventeen cave minerals and mineraloids present include ice, calcite, barite, gypsum, cristobalite, opal-a', "amorphous" silica, quartz, silhydrite, "basalt," "andesitic basalt," pyrolucite, romanechite, two very unstable, undescribed hydrous sodium sulfite and hydrous sodium sulfo-carbonate salts, plus uric acid and amberat. The ice is seasonally frozen ground and seepage rainwater. The calcite was derived primarily from adjacent seasonally dry, high calcium lake sediments. The sulfates were derived from volcanic sulfur deposits combining with adjacent dry lake sediments. Most of the silicate minerals origin is solution of unstable pumice and ash carpeting the volcano and subsequent rapid evaporation of modestly saturated groundwater. The romanechite and pyrolucite apparently is derived from limited solution of iron-manganese-bearing basalts. The uric acid and amberat are byproducts of woodrats.

Speleothems include stalactites, draperies, spathites, helictites, stalagmites, flowstone, moonmilk, coralloids, crusts, and conulites. The lava speleothem-like decorations may be either primary and contemporary with tube formation or secondary from a re-melt episode.