



FEATURES OF ETNA LAVA STALACTITES

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Abstract

Lava stalactites are one of the most spectacular features observed into lava tubes. While some stalactites form from mineral precipitates at the end of eruptions (1), the majority form in response to thermal and mechanical processes during flow and subsequent drainage. Stalactites on Etna have shapes and sizes that differ significantly from some of their Hawaiian counterparts. For example, the delicate, worm-like structures found on the roofs of lava tubes on Hawaii (2) have not been observed on Etna.

On Etna, Calvari and Pinkerton (3) have distinguished four kinds of stalactites, of which there are excellent examples on the walls and roof of the Tre Livelli and Cassone tubes. Stalactites with very smooth surfaces form on ridges that are elongated in the flow direction. These stalactites are typically red in colour, and they are considered to form by remelting by gases accumulating below the roof (2, 3, 4). On Etna they are typically up to a few centimetres long and at most 2 cm wide at the base, and they are conical in shape. Another type is rough, grey in colour and spiky, and it is usually found in constrictions of the tube. This second group of stalactites was also recognised by Jaggar (2). They are generally less than 0.5 cm wide, a few centimetres long, and they are considered to have formed where lava completely filled a tube and then drained, either partially or completely. The resulting stalactites record the dribbling of lava from the roof. The spiny nature of these stalactites is due to the presence of crystals (mainly plagioclase) and small amount of interstitial glass. The third group of stalactites are morphologically similar, and they form when part of the roof or wall lining drops or rolls off, leaving rough 'pull-apart' stalactites. The final type of stalactite, which is not very common, is characterized by bulbous shapes. Thin sections reveal that they are composed of multiple layers with an external boundary marked by a very thin film of oxides. We interpreted these as stalactites that have been repeatedly coated by lava. Here we present some measurements performed on three different kinds of lava stalactites sampled inside the Tre Livelli Tube which formed during the 1792-1793 Etna eruption.

References

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