

SUBMARINE PYROCLASTIC ROCKS OF THE LA PALMA «OPHIOLITE» COMPLEX

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ABSTRACT

The basement of La Palma (Canary Islands) consists of plutonic and hypabyssal intrusives and a submarine series, 2.5 km thick. Pyroclastic rocks increase in thickness upwards in the section and dominate at the top where they are several 100 meters thick. The clastic rocks in the pillow-dominated section are well bedded to cross-bedded hyaloclastites forming layers generally < 2 m thick, and thicker beds (up to 5 m) of coarse breccias which range from incipiently fractured pillows, that came to rest nearly in situ, to coarse, well sorted breccias deposited some distance from their source. Clastic rocks in the upper section are massive to poorly bedded, dominantly lapilli- to sand-sized whit clasts, being generally highly vesicular and larger fragments being reddish oxidized displaying shapes and vesicularity intermediate between pillows and sub-

aerial scoria. We think these clastics formed close to and, perhaps, just above sea level when the seamount precursor to La Palma island was emerging. Low overburden permitted explosive disruption of magma resulting in much higher portion of clastic basalt. Instability of thick clastic masses resulted in periodic slumping and downslope mass transport, possibly feeding widespread submarine pyroclastic debris flows, such as those described by Schmincke & v. Rad (1979) from south of Gran Canaria. The presence of a thick clastic section near the top may also have influenced the pattern of hydrothermal circulation systems: greenschist facies minerals such as epidote have not been found above the lower few meters of the thick hyaloclastite in the upper section, possibly because convecting fluids were dammed at the base of the hyaloclastites that had become impermeable due to wholesale low temperature alteration to smectite and other phases.

A comparison will be made between the La Palma complex and constructional processes in oceanic crust found at Mid Oceanic Ridges.

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