



Probing the Pink Pumice: petrological and textural insight into Popo's youngest plinian eruption

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Popocatepetl volcano, located 46 km east of Mexico City is well-known for its ongoing open-vent degassing and vulcanian eruptions. In the past 23,000 years, Popocatepetl produced 7 plinian eruptions with the last one occurring 1100 years ago. The 1100 year eruption is the source of the Pink Pumice fall deposit. Despite being the youngest, and therefore the easiest deposit to identify in the field, the Pink Pumice is still understudied. Here we present preliminary data on the Pink Pumice fall deposit, providing new insight on magmatic and eruption processes at Popocatepetl.

The Pink Pumice fall deposit consists of at least three eruptive pulses (Siebe et al., 1997). Each pulse was separated by surges, although to date, no pyroclastic flow deposits have been identified. The individual pulses, from oldest to youngest, are labelled Pink 1, 2, and 3, respectively. The deposits from the pulses are characterized by varying amounts of pumice, dark lithics, and crystals (Pl, Px, Ol and Ox). In all 3 pulses, individual pumices are light and dark beige, but in Pink 3 both colors are found in same pumice clast in a mosaic-like pattern suggesting magma mingling. Pumices from all three pulses and the elongate black fragments are all andesitic. The pumice clasts in Pink 1 and 3 are crystal-poor with <5% crystals which are mainly pyroxene whereas Pink 2 pumices are crystal-rich (~15%) and the main mineral phase is plagioclase. The Pink 1 deposit is recognized by the presence of elongated black lithic fragments. However, a closer look at their external morphology suggests the black lithic fragments were shaped while still ductile. Furthermore, their geochemistry is identical to the co-eruptive pumices, which consequently suggests that these black fragments are in fact co-magmatic with the Pink 1 pumice. These black fragments are very rare or absent in Pink 2 and 3. High resolution image analysis indicates that the presence vs absence of microlites and vesicles in the matrix glass directly correlates with the color of the pumice. The presence of the black elongated fragment along with the pumice suggest complex volcanic/magmatic processes and magma ascent dynamics. In fact, we proposed that fragmentation process and depth vary for all three pulses. Recent activity at Popocatepetl is characterized by low explosivity eruptions and persistent summit degassing, making the surrounding population believe that it is harmless and fairly predictable. The truth is that the volcano has had periods of more explosive eruptions, and characterizing Popocatepetl's plinian deposits will highlight the explosive potential of this volcano.