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LIQUID IMMISCIBILITY AND MAGMA FLOW IN CALC-ALKALINE GLASSY AND PLUTONIC ROCKS. IMPLICATIONS FOR MAGMA RHEOLOGY AND DIFFERENTIATION IN DEEP MAGMA CHAMBERS

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Flow during ascent and emplacement of magmas undergoing liquid immiscibility may have important consequences in magma rheology and differentiation. Strongly elongation of liquid-liquid structures may produce the fine lamination encountered in calc-alkaline vitrophyric domes of the Piedra Parada caldera (El Chubut, Argentina). Compositional portioning between liquids implies the enrichment in water in one of the two liquids, conferring to the system a particular rheological behaviour in which one of the two liquids may be several orders of magnitude less viscous than the other. The study of these relations in volcanic glassy rocks offer a good opportunity to understand these complex processes. We have attempt to apply the observations in volcanic glasses to the interpretation of magmatic structures partially preserved in plutonic environments. The careful study of geochemical partitioning between immiscible liquids represented by glassy volcanic rocks, strongly suggest that a similar process has dominated the generation of intermediate rocks included as magma globules in plutonic calc-alkaline batholiths. These magma globules may represent immiscible liquids produced in a plutonic environment. We show in this report as many magmatic structures found in plutonic calc-alklaine rocks, namely microgranular enclaves, synplutonic dikes, schlieren, etc, are the result of dynamic interaction between to immiscible liquids, possibly generated from a common parental liquid. Laboratory experi-

ments have been performed in order to reproduce textural observed in natural rocks and predicted by thermodynamic models. These textures are the result of the complex evolution of immiscible liquids during cooling in a magma chamber.