

## Origin of compositional diversity at Volcán Pelado, a medium-sized shield in the central part of the Trans-Mexican Volcanic Belt

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Pelado volcano, located in the central part of the Trans-Mexican Volcanic Belt, is a typical monogenetic *Mexican shield* with two summital cones. Detailed petrologic, geochemical and isotopic studies reveal important changes in the mineralogy and bulk-rock composition of the products with time during the eruption. Early products are olivine-bearing basaltic andesites, while late products are orthopyroxene- and plagioclase-bearing andesites to dacites. Evolution in bulk rock composition is not monotonic; rather, observed major element trends reverse during the late stage, such that the most evolved products were emitted in the middle of the late stage, and subsequent products were more mafic. Major element trends within the early stage can be modeled by fractional crystallization of the observed phenocryst phases under shallow and hydrous conditions, while for mid- to late stages the model fit is poor.

<sup>187</sup>Os/<sup>188</sup>Os isotopic ratios (0.13603-0.20386) correlate with major element composition, with more evolved samples generally more radiogenic in Os. In contrast, <sup>206</sup>Pb/<sup>204</sup>Pb (18.646-18.702) and <sup>87</sup>Sr/<sup>86</sup>Sr (0.70404-0.70413) become progressively more radiogenic, and <sup>143</sup>Nd/<sup>144</sup>Nd (0.51278-0.51291) less radiogenic, throughout the duration of the eruption.

Preliminary interpretation of these data suggests that at Pelado, crustal contamination played a role in the evolution of the magmas alongside fractional crystallization and possibly magma mixing, in contrast to other, smaller monogenetic volcanoes such as Jorullo and Parícutin, whose compositional variability can be explained by mantle source heterogeneity without significant crustal contamination [1,2].

[1] Rasoazanamparany, C. et al (2016) Chem. Geol. 434, 62-80. [2] Larrea-Márquez, P. et al (2016) Magmatic processes of Parícutin volcano: rapid fractionation with no crustal assimilation? IAVCEI General Assembly 2016, Portland, OR, 14-18 Aug.