



## **Petrology and geochemistry of the San Félix-San Ambrosio islands, Eastern Pacific**

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The San Félix-San Ambrosio (SF-SA) islands, Eastern Pacific, are fragments of two volcanic sequences 20 km apart. Both represent the top of an eroded large shield-volcano which rises over the Nazca Plate. Here, new geochemical and  $^{40}\text{Ar}/^{39}\text{Ar}$  geochronological data are presented in order to understand magmatic evolution and source features. Two units are recognized on the SF island: (1) the Cerro Amarillo unit (CAU) ( $190\pm 30$  ka) formed by a hyaloclastic-tuff cone and basanitic lavas ( $\text{Ba}/\text{Yb}=5.19$ ;  $\text{Ba}/\text{Zr}=2.19$ ;  $\text{La}/\text{Yb}=49.88$ ;  $\text{Nb}/\text{Ta}=17.96$ ;  $\text{Nb}/\text{Y}=3.78$ ;  $\text{Nb}/\text{Zr}=0.25$ ) with absent or scarce modal content of plagioclase (<5%); and (2) Plateau unit (PU) ( $210\pm 60$  ka) formed by a basanitic lava succession with high modal content of plagioclase (>20%). The hyaloclastic-tuff cone of the CAU contains aphanitic-trachytic lithic fragments of Na-augite and kaersutite, which correspond to the final product of fractional crystallization of olivine+clinopyroxene+Fe-Ti oxides+apatite±plagioclase from alkaline primitive liquids similar to SF-SA lavas. The geochemical data suggest that the islands represent different evolutionary stages of a same volcanic intraplate complex. The alkaline to transitional SA lavas ( $\text{Ba}/\text{Yb}=2.49$ ;  $\text{Ba}/\text{Zr}=1.60$ ;  $\text{La}/\text{Yb}=24.62$ ;  $\text{Nb}/\text{Ta}=16.55$ ;  $\text{Nb}/\text{Y}=2.22$ ;  $\text{Nb}/\text{Zr}=0.19$ ) would represent the shield stage (ca 2.9 Ma), while the basanitic SF lavas the post-erosional stage (ca 0.2 Ma). Considering the Sr-Nd-Pb isotopic data of the SF-SA lavas, previous works have ruled out a genetic relationship between SF-SA islands and the nearby Nazca Ridge. An heterogeneous mantle plume with mantelic metasomatized recycled lithologies is hypothesized as a possible magmatic source capable of explaining the petrologic differences between the SF-SA islands and between the CAU and PU, in SF island.

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