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# Experimental phase relations and liquids evolution of the Roman Province ultrapotassic magmas

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Plio-Quaternary magmatism in Italy shows an highly variable composition ranging from subalkaline to ultra-alkaline and its origin is strictly connected with the complex geodynamic setting of the area. In particular, the ultrapotassic rocks of the well-know Roman Province are thought to result from the combined effects of crystal fractionation and crustal assimilation within reservoirs open to volatiles, starting from primary magmas derived from metasomatised mantle. However, very few experimental studies addressed to constrain the phase relations and liquids evolution of these ultrapotassic magmas have been performed. In order to investigate on processes leading to different lines of descent from one parental magmas, phase equilibrium experiments have been performed on an aphyric MgO-rich (mg# $\sim$ 70) K-alkaline-basalt from Montefiascone Volcanic Complex (Vulsini Volcanic District, Central Italy). This composition, characterized by high Cr and Ni contents ($>$1000 and $>$300 ppm respectively), has been considered representative of a parental melt belonging to the Foley ‘s et al. (1987) Group III ultrapotassic rocks. High pressure experiments were performed in a Piston Cylinder apparatus ($fO_2$=NNO+2) at P=1.0 GPa, T=1220-1350˚C and at vapour-absent conditions; low pressure runs (1atm) were conducted at unbuffered $fO_2$, using a vertical furnace, at the temperature range 1250-1350˚C. In the high pressure experiments Cr-spinel (T= 1350˚C) is the liquidus phase, followed by olivine and clinopyroxene. Crystallization is scanty down to 1275˚C and liquid composition keeps almost constant through this temperature range. Lower temperature experiments evidence re-

markable changes in the liquid chemistry which moves to tephritic compositions as a consequence of the consistent abrupt crystallization. At atmospheric pressure, crystal cosaturation (spinel+olivine+clinopyroxene) is attained at 1350˚C, and the coexisting liquid, shoshonitic basalt in composition, evolves at lower temperatures toward a latite-phonotephrite melt. High and low pressure experimental results suggest that the major influencing factor on the liquids evolution appears to be the $fO_2$ conditions. Experimental investigation at low pressure under different $fO_2$ conditions are performing.