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Sr-O isotope geochemistry and mineral chemistry of recent volcanic rocks from Ischia island (Phlegrean Volcanic District, South Italy): inferences for the nature of the source region and the behaviour of the magmatic system in the past 2.9 ka

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The island of Ischia is an active volcanic field belonging to the Phlegrean Volcanic District (South Italy), which includes also the Campi Flegrei caldera and the islet of Procida. Ischia is located in the north-western corner of the Gulf of Naples. The history of the island has been characterized by a complex interplay among volcanism, tectonism, volcano-tectonism, erosion and sedimentation. Volcanism began prior to 150 ka B.P. and continued, with quiescence periods centuries to millennia long, until the last eruption occurred in 1302 A.D. Early volcanism culminated with the caldera-forming Mt. Epomeo Green Tuff eruption (55 ka) which was followed by block resurgence of the caldera floor, at least since 33 ka. Resurgence dynamics influenced the later volcanic activity determining the conditions for magma ascent mainly within the eastern portion of the island and along pre-existing regional faults. During the last period of activity, started 10 ka B.P., volcanism was mainly concentrated around 5 ka and in the past 2.9 ka. The volcanic system is still active, as testified by the intense volcanism in historical times, widespread fumaroles and thermal springs, and seismic activity.

The past 2.9 ka volcanic activity at Ischia has been characterized by both explosive and effusive eruptions, which emplaced pyroclastics and lavas. These volcanics range in composition from shoshonite, through latite and trachyte, to phonolite, and have

variable isotopic composition of Sr, Nd, Pb and B. Also, most of these rocks exhibit textural and mineralogical evidence of being the products of mixing and mingling among mafic and felsic magmas. New mineral chemistry data and Sr-O isotope data on separated minerals have been acquired for selected volcanic rocks. The new data, combined with those available on whole-rocks, have allowed us to shed light on the nature of the source region of Ischia magmas, and on the evolution processes undergone by magmas during their stagnation in crustal reservoirs and ascent toward the surface. The results of these investigations have been integrated with volcanological and structural data in order to better understand the behavior of the magmatic feeding system of Ischia in recent times.