

REE exploration in carbonatites, alkaline magmatic rocks and corresponding paleosols at intraplate oceanic islands (Gran Canaria and Fuerteventura, Canary Islands, Spain)

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A representative sampling of carbonatites, alkaline felsic igneous rocks and corresponding paleosols was carried out on Gran Canaria and Fuerteventura (Canary Islands, Spain) in order to assess the geochemical composition, focussing on Rare-Earth Elements (REE). Thus, we analysed 70 samples of plutonic, subvolcanic and volcanic rocks from the Miocene declining and Pliocene rejuvenation volcanic stages, and associated soils (B-C horizons) on Gran Canaria. In addition, 40 samples from the Oligocene-early Miocene submarine magmatic stage composed by syenites, nepheline-syenites and carbonatites (veins, dykes and stocks), as well as from the Miocene alkaline declining stage with trachytes and quartz-trachytes (domes) have been studied on Fuerteventura. The maximum REE contents (mg/kg) for Gran Canaria are in the Miocene syenites (474-590), trachytes (588-601), phonolites (828-1036) and rhyolites (446-577), whereas lower values are found in Pliocene trachytic lavas (446) and phonolitic domes (333-577). REE enriched C-B horizons range from 429 to 1,584 mg/kg. In Fuerteventura, REE contents in Oligocene-early Miocene syenites range between 51 and 1,761 mg/kg; from 697 and 7,372 in carbonatites and from 90 to 394 in Miocene trachytes. According to our results, LREE are one order of magnitude higher than HREE, and REE resources from Gran Canaria are significant in Miocene felsic igneous rocks and their paleosols, while early-Miocene carbonatites are the best REE exploration target in Fuerteventura.