

## **Geochemical and isotopic signatures as proxies for source mantle composition in a post-collisional tectonic setting: An example from SW England**

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The Late Carboniferous/Permian geology of SW England has long been interpreted to reflect Variscan collisional processes associated with the closure of the Rheic Ocean and the formation of Pangea. The Cornish peninsula is composed largely of Devonian and Carboniferous volcanic-sedimentary successions that were deposited in shallow, syn-collisional basins and were subsequently metamorphosed and deformed during the Variscan orogeny. Late Carboniferous granitic magmatism is voluminous and widespread, and is broadly coeval with the emplacement of Late Carboniferous-Early Permian lamprophyre dykes, sills, - and flows. Although these lamprophyres are well mapped and widely documented, the processes responsible for their genesis are less understood. Syn-rift basalts from the Devonian/Carboniferous sedimentary basins are moderately enriched in LREE, and have HREE profiles that indicate a shallow mantle source. They have trace element concentrations characteristic of alkaline within-plate basalts. Geochemical analysis shows the lamprophyres are extremely enriched in light rare-earth elements (LREE) and large- ion lithophile elements (LILE), which suggests they were generated from a deep, previously metasomatized mantle. Sm-Nd isotopic data indicate a continental lithospheric mantle source and those compositions of the magmas were modified by crustal contamination. By combining the data from mafic rocks spanning the Devonian and Carboniferous periods (and hence the Variscan orogeny) we can gain insight into how the mantle evolved during a continental collision and how rocks generated in a collisional setting are affected by mantle evolution.