

## **Part IV Radiogenic Isotopes**

As shown in the preceding text, a suite of magmas affected by an open-system process, i.e. interaction with a compositionally dissimilar external component (magma mixing, AFC, hydrothermal alteration, metasomatism...), will generally display regular geochemical patterns. However, such trace-element evidence is often, and major-element variation always, equivocal. The best proofs for operation of open-system processes remain radiogenic isotope ratios which are generally not fractionated during closed-system processes such as melting or crystallization. The magmas formed should preserve the isotopic characteristics of their source. In other words, the radiogenic isotope data are totally transparent to mechanisms of closed-system magmatic differentiation but are very sensitive to mixing or contamination.