

CARIBBEAN GRANITOIDS

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ABSTRACT

Caribbean granitoids are part of a series of widespread magmatic arcs that developed in an oceanic convergent margin tectonic setting. The granitoids record compressional events that began in Late Cretaceous time during a period of major plate convergence. A review of Caribbean granitoids reveals that at least two main types of granitoid complexes are widespread. The first of these are low-K granitoids comprised of gabbro, diorite, quartz diorite, and tonalite. The second main type of granitoid complex is distinctly more potassic and is composed mainly of quartz monzodiorite and granodiorite, but also includes monzodiorite and granite and the low-K analogs of these rocks. Both of the two main groups contain rocks that are gradational into the other group. All of the granitoids are part of an extensive Caribbean calc-alkaline association that includes low-K, medium-K, and high-K varieties. Island arc tholeiitic and normal calc-alkalic compositions reflect a geochemical continuum of the orogenic granitoids. All of the granitoids (including low-K rocks) lie within the calc-alkaline field on FeO^T/MgO and AFM diagrams. Alkali-lime indices generally correlate with potassium content, the low-K varieties being calcic (tholeiitic) and the higher K rocks being calc-alkalic.

Rare earth element concentrations range from primitive compositions having flat patterns and abundances about 10-30 times chondrites to more evolved types that show mild enrichment in light rare earths and which are more typically normal calc-alkaline. Mean initial $^{87}\text{Sr}/^{86}\text{Sr}$ ratios are mainly in the range 0.703-0.704. These low ratios are consistent with a mantle source in which assimilation of old sediments was not a factor. Limited isotopic and trace element data suggest, instead, that at least some of the granitoids contain a subduction-related component that was dominated by an aqueous fluid phase.