

ABSTRACT

Tertiary volcanic rocks of Carriacou, Grenadines, occupy the western two thirds of the islands; the remaining eastern part consists of calcareous sedimentary rocks of Miocene age. The volcanics include agglomerates and tuffs (60%), lava flows (30%) and dome lavas (10%).

Four volcanic phases are recognisable. The first probably belongs to the upper Eocene and resulted in andesite domes and flows which outcrop in the north and south of the island. The second phase which occurred sometime between upper Eocene and lower Miocene was basaltic with the predominance of mudflows in the north and lava flows in the south. The third phase which took place in Miocene time was the formation of basaltic andesite flows and domes in the south. In the fourth and final phase, which probably occurred in upper Miocene or Pliocene, basaltic dykes intruded into Miocene sediments.

Volcanics from Carriacou range in composition from basalts 44% Si to andesites with 61% SiO₂. Basalts (SiO₂= 44 - 53%) account for an estimated 50%, clinopyroxene basaltic andesites (SiO₂= 53.01-58.0%) 10% and hornblende clinopyroxene andesites (SiO₂= 58.01-62.0%) 40% of the surface outcrops.

Carriacou basalts fall into two types (a) megaphyric clinopyroxene basalts and (b) microphyric olivine basalts; the latter having higher MgO and lower Al₂O₃ than the clinopyroxene basalts. Both types are unusually rich in mafic minerals compared with Lesser Antillean basalt in general, although similar types have been reported from Grenada.

Chemical analysis show that the basalts have tholeiitic and high alumina affinities, the former being similar to the Hawaiian tholeiite while the latter belongs to the hypertholeiitic or calc alkaline series. The potash to silica ratios are relatively high for basalts from the Lesser Antilles and can only be compared with those from Grenada.

Except for a high K₂O , basaltic andesites and andesites from Carriacou correspond closely in mineralogy and chemical composition with typical andesites from elsewhere in the Lesser Antilles.

The relative abundance of basalts, the occurrence of apparently accumulative phenocrysts in the basalts, the presence of about 5% of cumulate plutonic blocks among the andesite clastic deposits and the variation in chemical composition throughout the series suggest that fractionation of a primary basaltic magma was probably an important factor in the evolution of the rocks of Carriacou.