

## **Abstract**

The Quaternary Chyulu Hills Volcanic Province is located more than 100 km east of the Kenya Rift Valley. It consists of a large number of free-standing and coalesced volcanoes and cinder cones and numerous lava flows ranging in composition from nepheline-normative nephelinites, basanites, alkali basalts and hawaiites to orthopyroxene-normative subalkali basalts. In this paper, the authors briefly outline the geological setting of the Chyulu Hills Volcanic Province, present a classification scheme for its lavas and describe their petrography. Mineral chemistry data for selected olivine and clinopyroxene phenocrysts are presented together with the bulk rock major element compositions of selected samples. The petrography, phenocryst chemistry and bulk rock composition of the typically primitive Chyulu Hills lavas are consistent with a differentiation history dominated by olivine control. A process of delayed olivine fractionation, combined with limited mantle olivine accumulation, is proposed to explain the considerable compositional variability observed among olivine phenocryst cores. A trend of decreasing degree of silica-undersaturation from the oldest lavas, erupted in the northern Chyulu Hills, to progressively younger lavas in the southern part of the province is explained as a result of an age progressive decrease in the depth of melt generation and a coincident increase in the degree of melting.