



## Petrology and geochemistry of late Cretaceous lamprophyric rocks from North Anatolian Ophiolitic Melange-Turkey

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The late Cretaceous lamprophyric rocks from Amasya and Kalecik region occur as dykes, stocks and lava flows intruding volcanoclastic sequence of North Anatolian Ophiolitic Melange. Their major and trace element compositions are very similar and it is not possible to discriminate them as two subgroups according to their geochemical features. The  $Al_2O_3$  contents are variable, but relatively high (10.66-18.77 wt.%) typical for the ultrapotassic rocks from active orogenic belts.  $K_2O$  contents (wt.% 1.22-8.39) are variable and Mg numbers (41-60) indicate that they were crystallized from evolved melts. LILE enrichments relative to HFSE, depletions of Nb-Ta and Ti elements are the characteristic features on N-MORB-normalized spider diagrams and this pattern represent the addition of subducted sediment/melt to the source area .

The main mineralogic composition of samples from each two regions is *clinopyroxene + mica ± feldspar ± olivine ± amphibole ± leucite + opaque minerals*. The significant difference is the presence of plagioclase ( $An_{47-65}$ ) and K-feldspar as matrix in Amasya samples. Also some of the samples from Kalecik contain minor leucite. Based on the mineral paragenesis, Amasya lamprophyres are classified as minette-vogesite and Kalecik samples are classified as kersantite-vogesite. Clinopyroxenes are mainly diopside, salite and fassaitic in composition ( $Wo_{45-50}En_{26-43}Fs_{10-16}$ ) for the Kalecik region and displays diopsitic-salitic composition ( $Wo_{44-48}En_{38-47}Fs_{6-16}$ ) in Amasya region.

The pressure-temperature calculations reveal significant differences for the lamprophyres from Amasya and Kalecik regions. The pressure conditions of the clinopyroxene crystallization for Amasya samples are between 16-24 kbar corresponds to 48-72 Km depth while the crystallization depth of the clinopyroxene from Kalecik lamprophyres is restricted between 12-36 Km.

Although ultrapotassic rocks in Turkey are the products of extension related volcanism in a post-collisional setting, Cretaceous lamprophyric rocks from Amasya and Kalecik regions formed during the closure of Neo-Tethys that means they are either subduction related or generated during incipient phases of postcollisional relaxation.