

Evidence of Magma Mixing: Mineral Textures and Zoning of Pyroxenes in Lamprophyres from Jiaodong Peninsula, Eastern China

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Early Cretaceous lamprophyres are widely distributed as dykes in Jiaodong Peninsula, eastern China. Most of them are intruded into the granitoid plutons at the surface with similar occurrence to those associated with the gold ore bodies. Here, we combine the textural information and compositional data of pyroxene phenocrysts in lamprophyres and aim to investigate the magmatic evolution of lamprophyres.

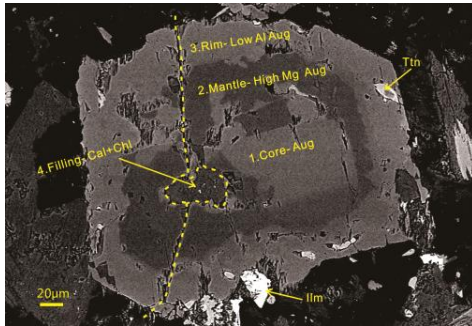


Fig1. BSE image of a pyroxene crystal with growth zonings

All of the lamprophyre samples are porphyritic with predominant phenocrysts of pyroxene which are mainly euhedral augite with a few of them showing core-mantle-rim texture (Fig1). Combining the textural information and geochemical data, we were able to identify three magmatic events and one thermal fluid event: 1) The primary magma formed the homogeneous pyroxenes phenocrysts and augite cores. 2) Meanwhile, a small amount of more basic magma injected into the magma chamber and formed high-Mg augite mantle-zone locally before the basic magma diffused widely. 3) Then, mixed magma formed the Low-Al augite rims. 4) Low temperature hydrothermal fluid permeating along the fissure and formed the calcite and chlorite after the formation of lamprophyres. The zoning of pyroxenes and other petrographic features provide important evidence for magma mixing origin of lamprophyres in Jiaodong Peninsula.

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