Goldschmidt 2026 Abstract
https://doi.org/10.46427/gold2026.35860

Eu isotope ratios in igneous minerals

SEUNG-GU LEE[1], YOSHIHIRO ASAHARA[2], HYEONCHEOL KIM[1], GOEUN KIM[1] AND KUN-HAN KIM[1]

[1]Korea Institute of Geoscience and Mineral Resources
[2]Nagoya University

Europium(Eu) is one of the rare earth elements and has two stable isotopes (^{151}Eu and ^{153}Eu). Recently, several groups have reported methods to precisely determine Eu isotope ratios by MC-ICP-MS using Sm or Nd internal standard [1-5]. In addition, the possibility of Eu isotope fractionation in igneous rocks has recently been reported [6-10]. In particular, Lee et al.[7,10] suggested that Eu isotope fractionation can be produced by hydrothermal reaction as well as during magma differentiation. Hu et al.[8] and Schauble [9] also proposed that Eu isotope fractionation may result from reactions with hydrothermal solutions and feldspar crystallization during magma differentiation. These studies suggest that both magma differentiation and hydrothermal alteration can cause Eu isotope fractionation during the evolution of igneous rocks. Therefore, it is necessary to investigate Eu isotope ratios in various igneous minerals. In this study, we measured rare earth elements (REEs) concentrations and Eu isotope ratios in feldspars including feldspar standard materials (SRMs) from the Geological Survey of Japan and NIST using ICP-QMS and MC-ICP-MS. Based on these results, we discuss the relationship between chondrite-normalized REE patterns and magnitude of Eu isotope fractionation in various igneous minerals.

[1] Lee & Tanaka (2019), *Spectrochim. Acta Part B* 156, 42-50. [2] Lee & Tanaka (2021), *Inter. Jour. Mass Spec.* 469, 16668. [3] Lee (2024), *Spectrochim. Acta Part B* 218,106991. [4] Nicol et al. (2023), *JAAS* 38, 1261-1274. [5] Wu et al. (2024), *Anal. Chem.* 96, 15102-15107. [6] Lee & Tanaka (2021), *Geochem. Jour.* 55, e9-e17. [7] Lee et al. (2023), *Geosci. Jour.* 27/3, 271-284. [8] Hu et al. (2023), *Geochim. Comochim. Acta* 348, 323-339. [9] Schauble (2023), *Geochem. Jour.* 57/4, 118-133. [10] Lee et al. (2025), *Sci. Report* 15, 28746.