

Potential for REE resources of weathered granitic rocks in the central Laos

Kenzo Sanematsu[1]; Hiroyasu Murakami[1]; Yasushi Watanabe[2]

[1] AIST; [2] IIGRE, AIST

A demand of REE (rare earth elements) resources has been remarkably increased in recent days and the production is dependent on China in the world. Especially HREE (heavy rare earth elements) resources are mostly provided from ion-adsorption type deposits of weathered granitic rocks in southern China. This kind of REE deposit is assumed to occur in weathered crusts of granitic rocks by chemical weathering under subtropical to tropical climate. The purpose of this study is to investigate a potential for ion-adsorption type REE mineralization in clay minerals by geological and geochemical studies on the granitic rocks and their weathered crusts in the central Laos.

Collected granitic rocks in the central Laos are Devonian - Jurassic biotite +/- muscovite granodiorite and granite, and they are locally accompanied by hornblende granodiorite. These granitic rocks mostly belong to S-type ilmenite series. Weathered crusts of the granitic rocks are well developed, with the thickness ranging from 10 to 30 m. The REE contents are high in biotite granitic rocks whereas they are relatively low in two-mica granitic rocks and hornblende granodiorite. The weathered crusts which are considered to be derived from biotite granitic rocks also show high REE contents, consistent with the result of fresh biotite granitic rocks. The granitic rocks and weathered crusts are generally enriched in LREE (light rare earth elements) rather than HREE. Some weathered granitic rock samples showing anomalously high REE contents are not rich in REE-bearing heavy minerals, suggesting that REE is contained in kaolinite, which is considered to be a REE-bearing mineral of REE in ion-adsorption type deposits. The result of this study indicates that S-type granitic rocks also have a potential for ion-adsorption type REE mineralization, although the dominant granitic rocks in the ion-adsorption type REE deposits in China are considered to be I-type ilmenite series.