オントンジャワ海台玄武岩の強親鉄性元素多様性
Highly siderophile element variations in the Ontong Java Plateau basalts

*石川 晃[1,2]、宇都宮 敦[3]、越田 渓子[1]、Tejada Maria Luisa[2]、小宮 剛[1]、鈴木 勝彦[2]、佐野 貴司[4]
*Akira Ishikawa[1,2], Atsushi Utsunomiya[3], Keiko Koshida[1], Maria Luisa Tejada[2], Tsuyoshi Komiya[1], Katsuhiko Suzuki[2], Takashi Sano[4]

1.東京大学、2.海洋研究開発機構、3.株式会社ジオ・コミュニケーションズ、4.国立科学博物館
1.The University of Tokyo, 2.JAMSTEC, 3.Japan Geocommunications Co. Ltd., 4.National Museum of Nature and Science

The Early Cretaceous Ontong Java Plateau is widely recognized as a product of the largest igneous activity on the Earth, and its formation and evolution has been investigated by multidisciplinary approaches in order to understand large igneous provinces (LIPs) in general. Recent geochemical studies suggest that the Ontong Java Plateau has sampled a near-primitive, less degassed deep mantle reservoir that has remained isolated from convecting upper mantle shortly after the formation of the Earth. Since such primitive reservoir is possibly only available at the base of lower mantle in the modern Earth, the plateau-forming lavas may have characteristic compositions of highly siderophile elements reflecting the deep-plume source likely influenced by core formation or core-mantle interaction. Here we report comprehensive dataset of Re-Os isotopes and highly siderophile element (HSE: Os, Ir, Ru, Pt, Pd and Re) concentrations for all three distinct geochemical types of the Ontong Java Plateau basalts. They are comprised of 11 samples of the less evolved Kroenke-type lavas (>8 wt.% MgO) from two deep sea drill sites (ODP Sites 1185 and 1187), 22 samples of the more dominant Kwaimbaita-type basalts (<8 wt.% MgO) from three drill sites (ODP Sites 1183, 1185 and 1186) and on-land exposure in Malaita, Solomon Islands and 22 samples of less voluminous Singgalo-type basalts (<8 wt.% MgO with a few exceptions) forming younger cover on the Kwaimbaita-types lavas at an ODP Site 807 and Malaita. All of Kroenke- and most of Kwaimbaita-type basalt data yield a linear array on the Re-Os isochron diagram corresponding to an age of 121.5 ± 3.1 Ma and initial $^{187}Os/^{188}Os$ ratio of 0.1304 ±0.0049, almost identical to those reported in previous studies. Singgalo-type basalts tend to show variably radiogenic initial $^{187}Os/^{188}Os$ ratios, indicating contributions of enriched components either derived from surficial environments or from radiogenic pyroxenitic source. Significant contributions of pyroxenitic source is inferred from the observation that Singgalo-type lavas have distinctively lower platinum-group element (PGE) abundances when compared with similarly evolved Kwaimbaita-type basalts, although sulfide-fractionation may have played a role on their depletions. The chondrite-normalized HSE patterns of Kroenke- and Kwaimbaita-type basalts show broadly similar IPGE-depleted and PPGE-enriched patterns typical of sulfer-undersaturated tholeiitic basalts. However, the two types can be distinguished by contrasting Os and Ru abundances (Kroenke: high, Kwaimbaita: low) probably reflecting the different degrees of olivine/spinel fractionation. Since the observed HSE fractionation trend (particularly Ir variation) is significantly different from those identified for Hawaiian picrites or Archean komatiites, further constraints on HSE behavior during magma evolution are clearly required for estimating HSE compositions of primitive magma and source mantle.

キーワード：巨大火成岩岩石区、玄武岩、白金族元素
Keywords: Large Igneous Provinces, basalt, Platinum-group elements

