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室生火砕流堆積物とその類似凝灰岩の全岩化学組成
Whole-rock chemical compositions and REE analyses of the Muro pyroclastic flow deposit and related tuffs

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The Muro pyroclastic flow deposit is the rhyolitic tuffs that are distributed from the central part of Nara prefecture to the western part of Mie prefecture, southwestern Japan. It consists of a 15 km (north-south) x 28 km (east-west) body. The tuff is classified into two main lithologies. One is a glassy dense welded tuff called ”black lava” and the other is a cryptocrystalline tuff ”white lava” that have suffered devitrification1). Both FT and K-Ar dating methods indicate that the age of the tuffs is about 15 Ma2). Several studies have been done for the Muro pyroclastic flow deposit(Shinjoe.H. et al, 2002: Iwano.H et al, 2007), however, the source is less well understood. In this study, we present newly obtained whole rock major, trace and rare earth element compositions of the Muro pyroclastic flow deposit and related tuffs. The related tuffs we analyzed are the Tamateyama tuff and the Sekibutsu tuff in Kii peninsula, and the Kn-1 tuff in Boso peninsula. A total of 15 samples were analyzed for chemical compositions. The whole-rock major-trace element compositions and REE compositions were analyzed by XRF and ICP-MS, respectively. Most of the samples except the Kn-1 tuff indicate that the SiO2 contents vary from 73.0 to 75.5 wt% and the alumina-saturation index (A.S.I.) are more than 1.1 which shows those rocks are peraluminous. However, the Kn-1 tuff indicates especially low values of SiO2 (SiO2 = 59.9 wt%) and A.S.I. (c. 0.3). It shows that the Kn-1 tuff is metaluminous. Furthermore, the Kn-1 tuff has higher value of CaO, MnO, and P2O5 than the other samples. The Kn-1 tuff might have different type of source from the Muro pyroclastic flow deposits. When compared with the chemical compositions between the white and black lavas, SiO2 content of the white lava is higher than the black lava, whereas the CaO, MnO, FeO∗, MgO and Na2O content of the black lava is higher than the white lava. However, both white and black lavas show similar chemical trends on the Harker’s variation diagrams. Most of the samples show nearly same pattern on the REE composition diagram s normalized by CI-chondrite. They are LREE-rich, mid-to HREE flat and negative Eu anomaly pattern. The chemical compositions of the Muro pyroclastic flow deposits have relevance to the related tuffs (Tamateyama and Sekibutsu) except the Kn-1 tuff.

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