海洋地殻の融解と堆積物の融解がマントルの不均質性に果たす役割

Effect of duplex slab melting for the production of mantle heterogeneity: implications from Sr, Nd and Pb isotope geochemistry for Aono volcanic groups in the SW Japan arc

*下田 玄[1]、新正 裕尚[2]、小木曽 哲[3]、石塚 治[1]、山下 勝行[4]、吉武 美和[5]、伊藤 順一[1]、小笠原 正継[1]
*Gen Shimoda[1], Hironao Shinjoe[2], Tetsu Kogiso[3], Osamu Ishizuka[1], Katsuyuki Yamashita[4], Miwa Yoshitake[5], Jun'ichi Itoh[1], Masatsugu Ogasawara[1]

1.産業技術総合研究所、2.東京経済大学経営学部、3.京都大学人間・環境学研究科、4.岡山大学大学院自然科学研究科、5.工学院大学
1.Geological Survey of Japan, AIST, 2.Faculty of Business Administration, Tokyo Keizai University, 3.Graduate School of Human and Environmental Studies, 4.Graduate School of Natural Science and Technology, Okayama University, 5.Tokyo Urban Tech

The early continental crust is characterized by the existence of tonalite-trondhjemite-granodiorite (TTG), thought to have formed in subduction zone either by melting of subducted oceanic crust or melting of thickened oceanic crust due to imbrication and accretion of oceanic crust. In the early '90s, modern equivalents of TTG were given the name “adakites”, following the definition of magmas from Adak Island. As the adakites closely relate to hot subduction zones, they are considered to be products of slab melting. In addition to the oceanic crust, sediments are important constituents of the subducted slab. As the sediments have lower solidus temperature than the oceanic crusts, the sediments could melt before or during the adakite productions. If this is the case, both subducted oceanic crust and sediments could have melted beneath hot subduction zones. As melts can effectively remove incompatible elements from slab, melting of oceanic crust and sediments would profoundly affect how the mantle heterogeneity has evolved throughout the Earth’s history. The SW Japan arc is characterized by active subduction of a relatively young (15-26 Ma) segment of the Philippine Sea plate, Shikoku basin, beneath the Eurasian plate and is known for the occurrence of adakites on the quaternary volcanic front. It is also likely that this subduction was accompanied by melting of sediments to induce the Miocene forearc volcanism. Hence, the SW Japan arc should be a suitable example to evaluate the role of melting of oceanic crust and sediments. In this paper, we will present new results of isotopic and trace element analyses of adakites from Aono volcanic group in the SW Japan and discuss behavior of the subducted crustal material at hot subduction zone.

