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# Across arc variation of Magma Composition in Central Sunda Arc, Indonesia: A test of slab influence to mantle source

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Sunda arc, a part of Pacific ring of fire, extends from West Java to Flores. The arc developed since Tertiary period at a convergent tectonic plate margin, where India-Australian plate is subducted northward beneath Eurasian plate. Central Sunda Arc (CSA) is represented by a series of volcanoes from the fore arc toward the back arc including Merapi, Merbabu, Telomoyo, Ungaran and Muria. The oldest activity represented by Muria was 1.11 Ma (Edwards, 1990) whereas the youngest one by Merapi was October 2010. Depth of Wadati-Benioff zone beneath CSA ranges from 190 km for Merapi (Gertisser & Keller, 2003) to 350 km for Muria (Nicholls & Whitford, 1989). Field works have been conducted for brief geologic observation and rock sample collection from Merbabu, Telomoyo, Muria, including Genuk on the north and Patiayam on the south of Muria. Data from Merapi is compiled from Handini (2010). Rock samples were analyzed using X-Ray Fluorescence, Prompt Gamma Ray and Instrumental Neutron Activation Analysis to obtain whole rock compositions. Using subduction component elements, we tried to estimate the sediment input from the slab in magma genesis of CSA.

High $Al_2O_3$ (˜18 wt%), low Cr (˜29 ppm) and Ni (˜27 ppm) from CSA products characterize the volcanic products from these volcanoes. $K_2O$ increases gradually with Benioff zone depth. Most samples from Merapi, Merbabu, Telomoyo and Ungaran are classified as subalkaline, whereas Muria samples fail on both Alkaline and Subalkaline fields. In detail, Merapi samples range from Medium-K to High-K, Merbabu Medium-K, Telomoyo and Ungaran High-K, and Muria samples range from High-K to Shosonitic and Leucitic. We only selected unfractionated lavas to avoid assimilation, including basalt, basaltic andesite, andesite, basanite, trachy basaltic andesite and trachyandesite.

Chondrite normalized REE pattern of Muria samples including Genuk and Patiayam shows steeper patterns than those from fore arc volcano. LREE to HREE ratios of Muria samples are up to four times higher than those from the frontal volcanoes. Lead to HFSE ratios (e.g. Pb/Nb) reach the highest point around Merbabu (˜17) and Telomoyo (˜21) instead of frontal Merapi (˜14), and gradually decrease toward back arc, suggesting the strongest sediment input at Merbabu and Telomoyo. Lead to HFSE ratios are the lowest (˜0.25) at Muria Leucitic products. Those of Muria shoshonitie are ˜0.67, and those of Muria High-K are ˜1.27. Boron to HFSE ratios which also indicate the fluid significance on magmatism shows similar pattern with Lead. These results from fluid mobile elements provide possibilities on estimating slab influence to mantle source in CSA.

Keywords: Subduction, Across sunda arc, Quartenary volcanism, Fluid mobile element