

## Lateral variation of trace element of volcanic rocks from East Java, Sunda arc: estimation of slab fluid contributions

Esti Handini<sup>1\*</sup>, Toshiaki Hasenaka<sup>1</sup>, Haryo Edi Wibowo<sup>4</sup>, Tomoyuki Shibata<sup>2</sup>, Yasushi Mori<sup>3</sup>, Agung Harijoko<sup>4</sup>

<sup>1</sup>Graduate School of Science and Technology, Kumamoto University, <sup>2</sup>Beppu Geothermal Research Laboratory, Kyoto University, <sup>3</sup>Kitakyushu Museum of Natural and Human History, <sup>4</sup>Department of Geological Engineering, Gadjah Mada University

We analyzed volcanic rocks from eastern part of Java island in order to estimate the influence of slab-derived fluid across the arc. Such lateral variation of slab-derived fluid contributions, from both sediment (SED) and altered oceanic crust (AOC), to arc magmas has been documented in central and western sections of Java island. The ratios of fluid-mobile elements to HFS (High Field Strength) elements (e.g. Ba/Nb, Ba/Zr, Ba/La) were examined as well to reveal the lateral variation of subduction components. We also evaluate the mantle source variability across this arc magmas by using Nb/HFSE (e.g. Nb/Ta, Nb/Zr) ratios.

Volcanic rocks from eastern part of Java island show general enrichment of LILE and LREE, and negative anomaly of Nb and Ti, in both the frontal-arc and back-arc regions. These arc magma's characteristics are also well observed in the volcanic rocks from central and western parts of Java island. The increasing ratios of Nb/HFSE in the back-arc region of eastern part of Java imply particular mantle source enrichment in this part. Subduction components, as represented by Ba/HFSE, are well observed all across the arc. These ratios decrease from volcanic front toward back arc, which suggests a recognizable influence of slab-derived fluid in this particular part of Java island. The back-arc alkaline volcanoes, such as Ringgit-Beser, are low in terms of Ba/HFSE ratios, suggesting the small input of subduction components. In terms of across-arc variation of slab-derived fluid, volcanic rocks from East Java show similar decreasing pattern, which is also shown by magmas from Central Java. However, the appearance of back-arc alkaline volcanism at 220 km depth of Wadati-Benioff zone, which is much shallower compared to 370 km in central part of Java, raises a question of different controls on back-arc volcano formation in Java island.

The decreasing patterns of slab-derived fluid across the eastern part of Java, which is recognized in Central Java as well, suggest the distinct contributions of slab-derived fluid into arc magmas in Sunda arc. In addition, this finding implies that subduction signature is observed not only in the frontal arc region, but also in the back-arc region of both East and Central parts of Java island.

Keywords: East Java, Sunda arc, slab fluid, lateral variation, trace elements