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Lateral variation of H₂O contents in Quaternary Magma of central Northeastern Japan arc

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In order to estimate the lateral variation of bulk magmatic H₂O contents (bulk water = dissolved water in silicate melt + excess water + hydrous mineral) across subduction zone, eruptive products of Adachi volcano, Hijiori volcano, and Dokusawa tephra are examined. Adachi volcano is located (38°13'15"N, 140°39'02"E) on the most front side of the Northeastern Japan arc, while Hijiori (38°36'31"N, 140°10'29"E) and Dokusawa (vent locality is believed to be near Hijiori) are near the back arc side, all of which belong the No. 4 finger of Tamura et al., (2003). Bulk rock water content of the front and back arc volcanoes were estimated from the major chemistry of melt inclusions in phenocrysts, water concentration of melt inclusions, bulk rock major chemistry, and thermodynamic computations using MELTS (Ghiorso and Sack, 1995). It is estimated that bulk magmatic H₂O content of frontal Adachi volcano is higher than Hijiori volcano in back-arc region. Our estimation is opposed to the previous estimation (e.g., Sakuyama, 1979), and suggesting the extent of contribution of slab derived water to decrease with increasing the distance from the trench. This research project has been conducted under the research contract with Nuclear and Industrial Safety Agency (NISA).

Keywords: Lateral variation, Island arc, Magmatic water, Subduction zone, Hijiori volcano, Adachi volcano