

## 地下水中に含まれるスラブ流体の新指標：塩水のLi-Cl-Br関係 The Li-Cl-Br systematics of saline groundwater: A new indicator for slab fluid

風早 康平<sup>1\*</sup>; 高橋 正明<sup>1</sup>; 岩森 光<sup>2</sup>  
KAZAHAYA, Kohei<sup>1\*</sup>; TAKAHASHI, Masaaki<sup>1</sup>; IWAMORI, Hikaru<sup>2</sup>

<sup>1</sup> 産業技術総合研究所地質情報研究部門, <sup>2</sup> 海洋研究開発機構・地球内部物質循環研究分野

<sup>1</sup>Geological Survey of Japan, AIST, <sup>2</sup>Geochemical Evolution Research Program, Japan Agency for Marine-Earth Science and Technology

In this study, we propose Br/Cl ratio as a new indicator for slab-derived fluids, which is useful to distinguish their sources between pore water and hydrous minerals in subducting slab. The areal distribution of slab-derived fluids and their sources using Li/Cl and Br/Cl as geochemical evidences will provide a view for water circulation in subduction zones.

Subducting slab contains waters (originally seawater) as pore water and many kinds of hydrous minerals. Hydrous minerals such as opal, clay or mica will decompose to release water during subsiding, and pore water will be released by compaction. Even though such complex process occurs, behavior of halogen ions in the subducting slab may be simple because they are always enriched in aqueous phase (pore water) and the rest are in minerals as a replacement of OH. Some metamorphic fluids in wedge mantle peridotite with Br-enriched signature have been observed and were indicated to be from pore water in the slab. The mineral dehydration process is supposed to be responsible for Br-depletion in slab-derived aqueous fluid. Therefore, halogens are potentially good indicators concerning with the water behavior in subduction processes.

The higher Br/Cl ratios (>0.0035 in wt.) have been observed in fossil seawater and oil field brines due to the addition of Br from organic matters. The very low Br/Cl waters (<0.0025 in wt.) have feature of <sup>18</sup>O-shift to the slab (magmatic) fluid end member, which is quite lower than that in seawater (Br/Cl = 0.0034 in wt.), indicating that these waters originate from dehydration of the slab.

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