# Trace amounts of halogens (Cl, Br and I) in mantle xenolith samples

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The contents of halogen and their relative abundance are highly informative when discussing the petrogenesis of mantle materials, because halogens differ in volatility from element to element. Among the halogens, especially, iodine is important element in discussion of the geochemical circulation in the earth's surface, oceanic crust, continental crust, and mantle [1]. There has been a limitation for the geochemical discussion of halogens due to the scarcity of reliable data for terrestrial rock samples. This deficit must be largely due to the difficulty in determining trace amounts of halogens in these samples. Recently, we have improved the radiochemical neutron activation analysis (RNAA) procedure for trace amounts of halogens (Cl, Br and I) [2].

In this study, mantle xenolith samples were analyzed by our RNAA procedure. The magma source of the mantle xenoliths analyzed in this study was from >60 km in depth. We demonstrate the data for three halogens in ten mantle xenolith samples. The nine samples were from South Africa and the one from Canada. The eight samples mainly consist of olivine and pyroxene, and the two include garnet.

Halogen abundances which are normalized to CI chondrite values can classify the ten mantle xenolith samples analyzed in this study into two groups (the samples including garnet and those consisting of olivine and/or pyroxene). In the latter samples, absolute abundances of iodine are higher than those of chlorine and bromine within a half order of magnitude. In the one in the former samples, the iodine abundance is higher than chlorine and bromine abundances by about two orders of magnitude, while in the other sample chlorine abundance is highest among three halohens.

[1] Deruelle *et al*. (1992) *EPSL* **108**, 217–227. [2] Sekimoto & Ebihara (2013) *Anal*. *Chem*. **85**, 6336-6341.