Geophysical Research Abstracts
Vol. 14, EGU2012-12399-1, 2012
EGU General Assembly 2012


# Bromine isotope analysis - a tool for investigating biogeochemical cycle of bromine-containing organic and inorganic compounds in the environment

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Bromine naturally occurs mainly in the form of bromide and is usually considered as a conservative tracer in the groundwater system. However, nowadays many synthetically produced organobromine compounds are introduced into the environment by humans. Due to a possible toxic effect of these compounds, investigation of their fate in the nature is of the utmost importance. In this sense, examination of isotopic composition of inorganic and organic bromine may serve as a powerful tool for understanding Br geochemical cycle.

Due to a relatively small mass difference between the isotopes 81Br and 79Br, bromine isotope fractionation originating from biotic and abiotic processes is expected to be in the range of several permille. Therefore, a highly precise technique for the bromine isotope ratio analysis is required.

This work presents a new methodology for the precise determination of bromine isotope ratio in inorganic bromides and individual organic compounds by MC-ICPMS. Attained external precision ($2\sigma$) up to 0.1‰ allowed employment of the developed technique for determination of the bromine isotope composition in organic and inorganic bromides and Br KIE in biogeochemical processes.