[JJ] Evening Poster | B (Biogeosciences) | B-BG Biogeosciences & Geosphere-Biosphere Interactions

[B-BG02]Interrelation between Life, Water, Mineral, and Atmosphere

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Mon. May 21, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

Life on Earth is based on a diversity of physical and chemical dynamics and processes throughout the history. Interaction between life, water, mineral (rock) and atmosphere is a key to understand co-evolution of Life and Earth. It is a brief since the pioneers proposed this session almost 20 years ago. Current JpGU meeting is filled with international- and interdisciplinary-joint sessions with similar aims to this session in responding to surrounding situations of JpGU and earth science field in Japan. Conveners believe that this session has provided an excellent opportunity to discuss such interdisciplinary research results and directions for about 20 years but are also afraid if this session may complete the initial goal. It is a matter for JpGU members to decide. This is a final call whether this session will continue in future. If you need this session, you will submit abstract of your research to this session for oral presentation with your intension. If we have less than 12 abstracts for oral presentation, we will cease this session in 2018. Join to this session!

[BBG02-P05]Hydrogen isotopic ratio of Archean mantle based on ion microprobe analysis of gabbro

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Water is one of the most important content for origin of life and biological activity. Hydrogen isotopic evolution of mantle may tell us water-cycling through the Earth history, though dD values of ancient mantle and its evolution is still largely unknown. Kyser and O’Neil (1984) evaluated that δD value of present mantle is -80‰ by MORB glasses. However, the MORB glasses rarely exist in sea floor basalt. In this study, hydrogen isotopic composition of Ti-rich amphibole in Archaean gabbro in 3.2 Ga Pilbara Formation, Western Australia was analyzed by ion microprobe in order to estimate the δD value of the 3.2 Ga mantle. The Cleaverville Formation is one of the best preserved records of ocean-floor metamorphism based on petrological and geochemical analysis (Shibuya et al., 2007; Shibuya et al., 2012). The high Ti content is characteristic of igneous amphibole, thus may reflecting δD value of the Archean source mantle. Based on the relationship between the structure and isotopic ratio analyzed by ion microprobe, small but a number of amphiboles occurred as exsolution lamellae in diopside are responsible for the low dD value, that may represent the dD value of 3.2 Ga mantle (− 119 ± 20 ‰). The results of this study demonstrated that mantle were depleted in deuterium at 3.2 Ga in comparison to modern mantle (dD = − 80‰).