
[EE] Evening Poster | B (Biogeosciences) | B-AO Astrobiology & the Origin of Life

[B-AO01]Astrobiology

convener:Hikaru Yabuta(Hiroshima University, Department of Earth and Planetary Systems Science), Seiji Sugita(Department of Earth and Planetary Science, Graduate School of Science, The University of Tokyo), Misato Fukagawa(名古屋大学, 共同), Fujishima Kosuke(Tokyo Institute of Technology, Earth-Life Science Institute)

Tue. May 22, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

Twenty years have passed since when the field of Astrobiology, which aims to unveil the origins, evolution, and habitability of life by integrating multidisciplinary fields, was established. Origins of Life are currently being re-conceptualized via expansion of prebiotic chemistry to systems chemistry and chemical space. Besides their relationship to life's building blocks, it is expected to demonstrate the significant roles of organic molecules in the history of planetary formation. The linkages among the variations in chemical compositions of deep-sea hydrothermal environments, geological settings, and ecological systems were systematically investigated. Cassini, which accomplished in the long-term explorations of the planets bearing liquid, had "Grand Finale" this year. Discoveries of extrasolar planets have been dramatically increased to date.

Originally, Astrobiology does not need a specific science category. We therefore aim to make this session so that Earth and Planetary scientists from all the categories join for discussing 'where we came from and where we are going' and for making novel integrated researches.

For the next stage of Astrobiology, presentations on the instrument development in space explorations, comparative studies of solar system and exoplanets, etc, will be very much welcome.

[BAO01-P08]Study of amino acid in the hydrothermal condition - In-situ DAC experiments at low pressure, and low temperature condition-

Kazuki Kubo², *Kazuaki Okamoto^{1,2,3} (1.Faculty of Education, Saitama University, 2.Graduate school of Education, Saitama University, 3.The United Graduate School of Education, Tokyo Gakugei University)

Keywords:amino-acid, hydrothermal condition, DAC experiment

Amino acids are organic compounds that form the fundamental part of life. Proteins are formed by peptide binding and polymerization of amino acids. Amino acids can be polymerized in the ridge hydrothermal field. Therefore, it has been considered that the ridge hydrothermal activity might have played an important role for the origin and evolution of life. Previous hydrothermal experiments were done using cold sealed hydrothermal bombs and auto claves. Therefore the quenched run charges were observed after high P, and T experiments. In order to perform in-situ observation of the amino acids at high P and T condition, we have conducted diamond-anvils cell (DAC) experiments with laser-Raman analysis. Our preliminary experiments show that glycine is stable at 1 GPa, 100 °C, and 1 GPa, 50 °C, with a negative P/T slope boundary. Above the stability field boundary, it is decomposed to methylamine, CO₂ and so on. The present study also shows that diglycine is stable much higher T conditions, 200 °C at 1 GPa. The present study concludes that the glycine can be stable in deeper part of cold hydrothermal field such as serpentinized mantle beneath the Lost city or Enceladus. The polymerized diglycine is also possible to stay in circulation of the cold hydrothermal zone.