

SPACE LIFE SCIENCES SYMPOSIUM (A1)  
Poster Session (P)

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Department of Chemistry, Tsinghua University, China, liym@tsinghua.edu.cnPOLYCONDENSATION OF N-PHOSPHOALANINE AND PEPTIDE FORMATION AT THE  
INTERFACE**Abstract**

Vesicular systems, which permit a particular arrangement of molecules, are considered to play an important role in the reactions in biological systems. Amphiphilic amino acid derivatives are good candidates for preparation of vesicles with good biocompatibility. The polycondensation of N-(O,O-di-n-hexadecyl)phosphorylalanine (DNTP-L-Ala), an amphiphilic N-phosphorylamino acid was found at the air/water interface. Stable insoluble monolayer (Langmuir film) formed by DNTP-Ala was detected by transmission FT-IR spectra. Interestingly, dipeptide derivative at the vesicle/water interface was identified by electrospray ionization mass spectrometry (ESI-MS), and the structure was further identified by tandem mass spectrometry (MS/MS), which suggests the peptide formation without any coupling reagents. This phenomenon led to the proposal of a model for the co-evolution of proteins and nucleic acids at the prebiotic stage, which draws a possible picture for self-assembling processes in the formation of primitive biopolymers at the early stages of evolution and the biosynthesis of biopolymer in ordered systems such as bilayer lipid membranes occurring in present life.