

## Characterization of analogues of amino acids and sugars in radiolysis products using solid phase micro extraction (SPME)-GC-MS

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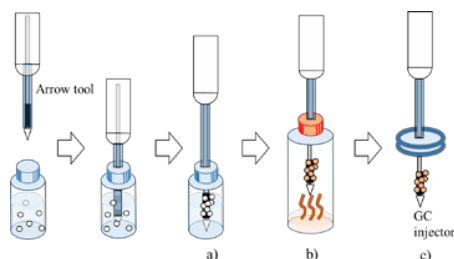
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### Purpose

Molecular evolution in the primitive earth has been investigated in terms of abiotic formation of amino acids, sugars, and their analogues which attracts the researchers studying the origin of life. Diverse biomolecular analogues formed in prebiotic syntheses should be targeted to discuss the early earth's selections of molecules. An NIST database search combined with 70eV GC-EI-MS would be most plausible way to qualify molecules in the first step without authentic standards. However, it takes long time and large effort to extract and derivatize the semi-polar targets before GC-MS. We are studying new approach to extract the target from the messy gamma radiolysis products with solid phase micro extraction (SPME Arrow<sup>TM</sup>) and on-fiber derivatization.



**Figure** A scheme of the on-fiber extraction and derivatization.

### Procedure

Online sample preparation and injection were conducted by a programmed CTC PAL RTC System. Optimization of parameters in the a) extraction and b) on-fiber derivatization before c) GC were carried out using standard sol. (1-1000 $\mu$ M), and Carbon WR and Acrylate fibers. Gamma radiolysis of aqueous small molecules gave no signals corresponding to the proteinogenic amino acids in a conventional HPLC. Applying the developed method, non-proteinogenic amino acids and sugar analogues in the radiolysis would be reported.