CAMT Seminar

“1D-simulation of RONS progression in liquids for biological plasma application”

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Center for Atomic and Molecular Technologies (CAMT)
(A12 棟 1 階会議室)

Abstract:
Plasma treatment frequently causes modifications and therefore inactivation of biopolymers, especially of proteins. For some applications, such as biocatalysis, protein inactivation needs to be prevented. Due to their overall high reactivity, short-living oxygen and nitrogen species are suspected to cause these effects. However, the exact species and circumstances of inactivation are yet unknown. Using a 1D simulation, we investigated the progression of RONS in the liquid phase after exposure to plasma. Simulation data showed that in-liquid RONS progression did not significantly change upon introducing a much greater RONS concentration in the gas phase, simulating a higher power input for the gas phase plasma. In the evaluated cases, RONS, especially •OH, were able to diffuse deeply into the liquid which could explain protein inactivation. These results indicate that spatial separation of protein and plasma are crucial to retain protein activity.

(Host: Satoshi Hamaguchi Ext：7913)