

CAMT Seminar

“Chitosan-acrylic acid hydrogel preparation and the effect of plasma treatment”

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Center for Atomic and Molecular Technologies (CAMT)

Abstract

Hydrogels are biomaterials with a 3D network made with hydrophilic polymers. Its structure is desired for biological applications as it can hold large amounts of aqueous solvents and biological fluids. The conventional route for hydrogel preparation is to polymerize monomers by introducing initiators and crosslinking reagents to form the 3D network. But for the case of natural polymers like chitosan and cellulose, the 3D network can be made without the use of reagents and relies solely on the hydrogen bonding of the side chains in the polymer backbone. The use of natural polymers for hydrogel preparation is more desirable for biological applications because natural polymers have chemical features similar to the macromolecules in the extracellular matrix of the skin. However, with just hydrogen bonding, the hydrogel formed has poorer stability compared to the conventional route. To address this, natural polymers are modified with monomers to improve stability. Plasma treatment of polymeric solutions like starch and chitosan has already been explored in several studies. This results in the degradation of polymers. However, the plasma in liquid phases results not only in polymer degradation but also in the generation of more reactive species such as OH radicals. The production of more reactive species may also produce more chitosan macroradicals. Given that the plasma could create a rich environment of radicals, the study aims to explore if the formation of the chitosan-acrylic acid hydrogel network can be feasible with the use of plasma treatment.

(Host: Satoshi Hamaguchi Ext:7913)