



学際物質科学研究センター(TIMs)セミナー

題目：『PREPARATION AND PROPERTIES OF MODIFIED PHEMA AND PNVP HYDROGELS CONTAINING PEG OR PEG-SULFONATE GRAFTS』

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場所： 総合研究棟 B 0110 公開講義室

概要：

PEG possesses a wide range of beneficial properties for biomedical applications, including low toxicity and being non-thrombogenic. Nevertheless, PEG is water-soluble and cannot be used directly in contact with blood or physiological fluids. PEG chains aimed to serve for biomedical applications have either to be grafted onto surfaces or crosslinked. The grafting of hydrophilic flexible PEG was reported to be more blood compatible due to low interfacial free energy, nonadhesive property, and highly dynamic motion effect. On the other hand, a negatively charged surface has been shown to be more blood compatible than a positive one. Especially many polymers containing sulfonate groups showed more or less enhanced blood compatibility.

Hydrogels are highly biocompatible because of their low surface tension, their hydrodynamic properties being similar to those of natural biological gels and tissues, and their minimal mechanical irritation due to the in soft, rubbery state. So, polymeric hydrogels have been increasingly applied in a variety of applications including diagnostic, therapeutic, and implantable biomedical devices. Recently the use of stimuli-responsive hydrogels in the field of controlled drug delivery and tissue engineering fields was highlighted.

In this work, both a methacryloyl PEG macromer with sulfonate end group (MA-PEG-SO₃H), which was prepared for this study, and a commercial PEG macromer with methoxy end were introduced to gel systems including PHEMA or PNVP to identify novel biocompatible hydrogels with modified bulk and surface properties. The effects on the swelling property, morphology, and surface wettability, and also preliminary results on the release and protein adsorption behaviors will be discussed.

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