

## A Study of Protein Adsorption on Poly(ethylene glycol)-Acrylamide Semi-IPN (Interpenetrating Network) Hydrogel

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Although poly(ethylene glycol) (PEG)-based hydrogels have been used widely as a biomaterial due to their biocompatibility and permeability, they have limited utility as the base materials for many applications due to their poor mechanical properties. In current work, interpenetrating hydrogel networks composed of PEG and poly(acrylamide)(PAAm) were prepared by a sequential network formation technique based on UV-initiated free radical polymerization for the purpose of enzyme immobilization. Incorporation of PAAm network inside PEG provided the enhanced mechanical strength as well as functional amine groups allowing the covalent immobilization of enzyme. Varying in the amount of PAAm incorporated in PEG hydrogel network, resultant IPNs had 9 times greater tensile strength compared to PEG single networks and capacity for enzyme immobilization almost linearly increased with the concentration of PAAm network. Activity of enzyme immobilized in these hydrogels was investigated using glucose oxidase as a model enzyme. In the future, hybrid materials composed of inorganic nanoparticle and hydrogel will be prepared and used for enzyme immobilization.