

Abstract Submitted  
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**Gradient hydrogel coatings for medical applications** PANDIYARAJAN CHINNAYAN KANNAN, JAN GENZER, NC State University — Mussel byssus is a typical example for gradient material that demonstrates a continuous variation in mechanical property (or modulus), *i.e.*, soft (proximal) part is connected to mussel, while the stiffer (distal) part facilitates the attachment of mussel to a stone. Mimicking such materials is highly demanding especially in the areas of artificial implants. We developed a simple synthetic route to produce gradient hydrogels that are covalently anchored to the substrate. N-isopropylacrylamide has been copolymerized with 5 mole% of photo-active (methacryloyloxybenzophenone) and/or 5% of thermally-active (styrenesulfonylazide) crosslinkers. The incorporation of photo and/or thermal crosslinkers allows us for a complete control over the network properties in orthogonal directions. A systematic investigation towards the gel kinetics, swelling, crosslink density, elasticity and protein adsorption was performed. Our results instigate that weakly crosslinked (low modulus) gels swell strong in aqueous medium than the densely crosslinked (high modulus) gels. The results of protein adsorption are discussed based on the previously developed model entropic shielding and size exclusion effect.

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