

ABSTRACT

STABILITY ENHANCEMENT OF ELECTROACTIVE POLYMERS VIA SURFACE CRAFT COPOLYMERIZATION OF HYDROPHOBIC MONOMERS

The potential of using electroactive polymers in practical applications depends to a large
5 extent on their stability. One of the problems frequently encountered is the partial
undoping of these polymers upon exposure to water or aqueous solutions which results in
the loss of the counterions from the polymers. The degradation of the polymers is
manifested as a decrease in electrical conductivity which may then be a few orders of
magnitude lower than the value for the pristine film. In the present invention, we have
10 graft copolymerized hydrophobic monomers on the surfaces of electroactive polymer films
and composites. The film and composites remain electrically conductive after the grafting
process. The presence of the hydrophobic polymer chains on the surface of the
electroactive polymer films and composites successfully retarded the degradation of such
films and composites upon immersion in water or mildly basic solutions. The conductivity
15 of the ungrafted polyaniline film after 24h in water is 100 less than that of the grafted film
subjected to similar treatment.

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