SYNTHESIS AND CHARACTERIZATION OF POLYANILINE-SILOXANE AND POLYANILINE-N-ISOPROPYLACRYLAMIDE COMPOSITES

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Abstract
Polyaniline (PANI) is one of the most popular conducting polymers. It displays high electrical conductivity, environmental stability, ease of preparation from common chemicals. We present the synthesis and characterization of composites of hydrophilic polyaniline colloids with two matrices. In the first part PANI was incorporated into siloxane resins during the hydrophilic stage of their synthesis via sol-gel. The goal was to combine the mechanical properties of the matrix and electrical ones of PANI. By changing the ratio of branching and linear monomers we were able to change the mechanical properties (characterized via DMTA). PANI dispersion was characterized via TEM. The composites’ electrical conductivity was measured as well.

In the second part we present hydrogel composites based on the hydrophilic poly(N-isopropylacrylamide) matrix and polyaniline (PANI). The aim was to obtain very fast temperature-responsive hydrogels, in analogy to previously prepared ones filled with nano-silica, but with conductive nanofiller able of inductive heating. Morphology, conductivity and mechanical properties of these composites will be discussed.

Keywords: siloxane, polyaniline, N-isopropylacrylamide, composite

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