

Morphology and radical reactions of Cu(II) and Co(II) sulfonated phthalocyanines covalently linked to poly(ethyleneamide)

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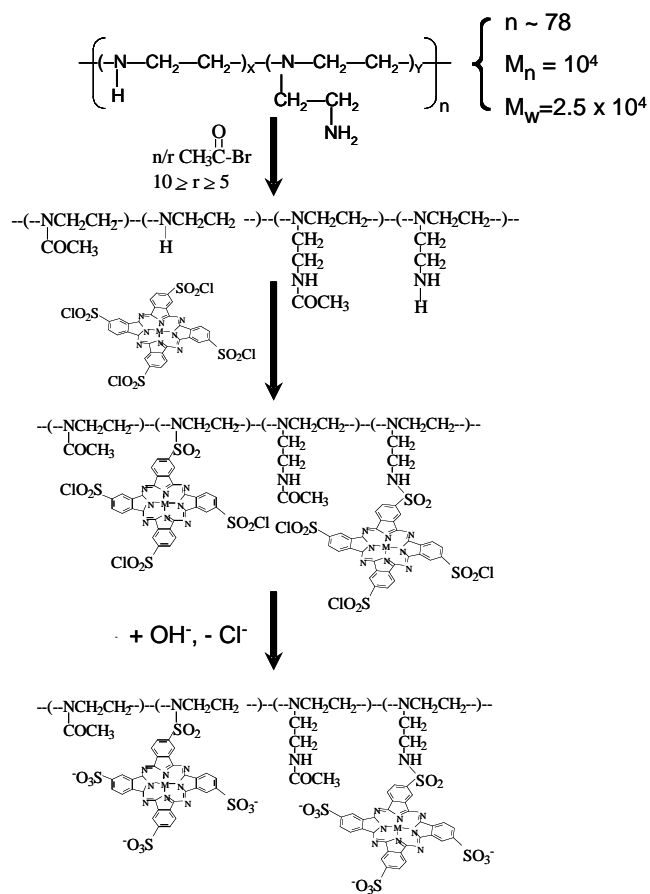
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Preparation of the polymers

The route followed for the preparation of the Cu(II) polymer is illustrated in the Scheme S1. A similar route using the trichlorosulfonated Co(II) phthalocyanine instead of the tetrachlorosulfonated Cu(II) phthalocyanine was used for the preparation of the Co(II) polymer. The first step of the preparation was a partial conversion of amine groups of the polyamine to acetamides with acetyl bromide. This conversion of amino to amide groups was used as a mean to control the loading of the phthalocyanines of complexes in the second step. Water soluble polymers containing the Cu(II) phthalocyanine were obtained when only one amino group in five or more than five was not acetylated. A Cu(II) phthalocyanine polymer, poly(K₃Cu^{II}tspc), with a 1:5 relationship such as in (I) was used in the studies described herein. The polymer containing Co(II) phthalocyanine, poly(K₂Co^{II}trspc), was obtained with a 1:15 relationship of phthalocyanine to the amine plus amide groups in the repeating unit, (II). Acetate detected in the polymer could be present as counter ions of ammonium salts formed between them and protonated tertiary amine groups. In the first step of the preparation, it was required to make a slow addition of the acetylated polyamine to an excess of the tri- and tetrachlorosulfonated phthalocyanines. The fast addition of the polyamine to the tri- and tetrachlorosulfonated phthalocyanine and/or adding the tri- and tetrachlorosulfonated phthalocyanines to the polyamine led to the formation of water insoluble polymers at the end of the preparation. These water insoluble materials probably had a large number of phthalocyanine pendants forming cross links which greatly diminish the materials' polyelectrolyte character. In contrast to these insoluble polymers, poly(K₂Co^{II}trspc) and poly(K₃Cu^{II}tspc) revealed to be negatively charged in electrophoretic experiments. When freshly prepared aqueous solutions of the polymers were placed in the electric field, the polymers run to the anode with a small spreading of the stains and lagged behind the blanks respectively made with solutions of Cu^{II}tspc⁴⁻ and Co^{II}trspc³⁻.



Scheme S1.

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