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Poly (N, N-dimethylaminoethyl methacrylate) – a new source of Bioactive Properties

Dawid Stawski

Lodz University of Technology / Institute of Material Science of Textiles and Polymer
Composites

Abstract

Poly(N,N-dimethylaminoethyl methacrylate) is a polymer with many important chemical and physical properties. Besides, it offers a wide range of important biological properties. Presently, research on this polymer is ongoing only in several centers around the world, including Lodz University of Technology in Poland. The first difficulty is connected with the polymerization process. The free radical polymerization can be realized according to different procedures, but, there are difficulties in obtaining a product with repeatable properties. This work collects together most of the currently known and used polymerization methods of N,N-dimethylaminoethyl methacrylate. Different factors are taken into account: the type of methodology, the solvent used, the initiator, as well as the process temperature and the average molecular weight of the product obtained. In next step the most important properties of the poly(N,N-dimethylaminoethyl methacrylate), are described and discussed. Selected properties such as solubility, bioactivity, hydrophilicity, cytotoxicity, conductivity, thermal and hydrodynamic parameters, are discussed on the basis of the available scientific literature and own experience. Among other things, the aim of this work is to increase the possibility of using this relatively new polymer as a material in advanced practical applications. Therefore, various ways of using the polymer have also been described. Copolymers of the monomer are now very large collection, and the most interesting examples were cited in this work.

Keywords: activity, biological properties; polymerization; poly(N,N-dimethylaminoethyl methacrylate); practical applications