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The Evaluation of Poly(imide) Siloxane to use in Biomedical and Radiotherapy Applications

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Abstract

Poly(imide) siloxane encourages new research studies that offer innovative and comprehensive industrial areas, experimental approaches and their innovative products. Poly(imide) siloxane covers the studies in fundamental organic polymer chemistry and physical organic chemistry, noval researches on membranes and interfaces. The possible applications of the poly(imide) siloxane as shielding material include facilities such as biological shielding at nuclear medicine departments.

Keywords: Copolymers; Poly(imide) siloxane; Radiation

Introduction

Polymer based drug gene delivery systems with critical structural features at the nanometere scale have attracted immense interest. Besides, polymer applications to drug/gen delivery has offered unprecedented opportunities for the creation of a variety of polymeric structures. The drugs including nanocarriers can be derived from poly(imide) siloxane. The medical polymers such as flexible poly(imide) siloxane depending on anti-infective properties can be used in several medical applications [1-3]. Flexible poly(imide) siloxane with high mechanical performance (with the modification of hydrophobic and/or hydrophilic properties) depends on the formation of functional groups such as hydroxyl at the surface.

Result and Discussion

Polymeric materials can be used to manufacture balloons, particularly dilatation balloons. Measurable characteristics of balloons in general, and more specifically dilatation balloons, include distensibility (the percent radial expansion with increased pressure), elastic stress response (repeatability of obtaining the same diameter at the same pressure during repeated inflation-deflation cycles), flexibility, tensile strength and optical clarity [4,5].

Polymeric structures for drug/gene delivery will be described in this study. Tissue engineering requires to be coated with drug-loaded micelles in order to release drugs or growth factors to prevent infection or enhance tissue regeneration. Poly(imide) siloxane can support to produce polymeric micelle coatings which can control drug release from surfaces. The flexible poly(imide) siloxane having rubber properties can be effective in several areas (for example; special nerve can be regenerated to conduct nerve stimulation and to improve peripheral nerve regeneration in tubulation of neural system) [6-8]. Starting from this point, it can be said that flexible poly(imide) siloxane block copolymer can be accep as the suitable material to use in medical applications, nervous system repair and to minimize bacterial adhesion to the polymer. The researches on flexible poly(imide) siloxane are focused on the success of the production and application of biodegradable polymers, biocompatibility polymers with high mechanical performance and resistant against radiation. Poly(imide) siloxane can used to evaluate the equivalent tissue thickness (corresponding to half value layer thickness of the poly(imide) siloxane by using different synthesis and heat treatment conditions [9,10].

Conclusion

Poly(imide) siloxane is recognized as new generation polymer in polymer science and engineering. The application area of poly(imide) siloxane covers several fields of particular interest are biomedical applications, organic electronics and photonics, nanostructures, micro- and nano-fabrication, biological molecules (DNA, proteins, carbohydrates) applications, polymers for renewable energy and many other influences, potential industrial application areas such as food, textiles, adhesives, biodegradables, biorefining, pharmaceuticals, and oil recovery, exchange of research in the area of macromolecular substances.

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