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The chemistry and applications of antimicrobial polymers

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Microbial infection remains one of the most serious complications in several areas, particularly in medical devices, drugs, health care and hygienic applications, water purification systems, hospital and dental surgery equipment, textiles, food packaging and food storage. Antimicrobials gain interest from both the academic research and industry due to their potential to provide quality and safety benefits to many materials. However, low molecular weight antimicrobial agents suffer from so many disadvantages such as toxicity to the environment, and short-term antimicrobial ability. To overcome problems associated with the low molecular weight antimicrobial agents, they are prepared by introducing antimicrobial functional groups into the polymer molecules. The use of antimicrobial polymers offers promise for enhancing the efficacy of some existing antimicrobial agents and minimizing the environmental problems accompanying conventional antimicrobial agents by reducing the residual toxicity of the agents, increasing their efficiency and selectivity, and prolonging the lifetime of the antimicrobial agents. Research concerning the development of antimicrobial polymer represents a great a challenge for both academic world and industry. This lecture reviews the state of the art of the antimicrobial polymers. In particular, it is discussing the requirements of antimicrobial polymers, factors affecting the antimicrobial activities, methods of synthesizing antimicrobial polymers, major fields of applications and future and perspectives in the field of antimicrobial polymers.

Biography

El-Refaie Kenawy is distinguished Professor of polymer chemistry at University of Tanta, Egypt. He is a graduate of Tanta University, Egypt. He did his PhD work according to channel Scheme at Strathclyde University, UK. He worked as Postdoctoral fellow and visiting Professor at many international universities as Pisa University, Gent University, Virginia Commonwealth University, Tokyo Institute of Technology, and Tanta University. He is a member of editorial board of many international journals and participated actively in many international conferences. He received the most cited award from Miser El-Kher Foundation, Egypt. His research interest mainly focuses on bioactive polymers, biomedical applications of polymers, antimicrobial polymers, electrospinning of polymers nanofibers, etc.

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