



Smart Polymer and Their Application

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ABSTRACT

The responses of biological organisms to environmental cues and their adaptation to shifting conditions. By creating so-called smart polymers for the past two decades, polymer researchers have been seeking to imitate this behavior. This category includes polymers that show reversible significant physical or chemical changes in response to minute outside alterations in environmental factors like heat, pH, sunshine, magnetic or electrical field, ionic variables, biomolecules, and others. With their constantly expanding range of uses, smart polymers have become a significant subcategory of polymers. Over the past two to three centuries, the subject has expanded quickly. Engineering, medicine, and biotechnology all use smart polymers. They are also known as environmentally sensitive polymers or stimuli-responsive soluble-insoluble polymers. Smart polymers have a wide range of biomedical uses, including as scaffolds for tissue engineering, cell culture, bioseparation tools, sensors, and actuator architectures. The goal of the current study is to explore smart polymers and their most significant and ground-breaking applications as biomaterials for tissue engineering and drug delivery. Dual-stimuli-responsive compounds will also be exhibited due to their promising future in the biomedical field. Despite the recent publication of numerous research in this area, the current review concentrates on the developments of smart polymers during the past ten years with specific industrial fields.

Keywords: Smart polymer, biomedical applications, environmental stimuli, medicinal substance delivery methods

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1. INTRODUCTION

In recent decades, there has been a significant increase in interest in intelligent and reactive products. It is widely acknowledged that the capacity of the components to establish independent features or to offer a preferred reaction to external behavior is of the utmost significance for the

advancement of active equipment, sensors, and effectors that are intended for use in innovative disciplines, particularly those that are dedicated to small-scale applications (Wei et al., 2017).

The use of a specific configuration of multiple components inside a predetermined pattern, also

