

STUDY OF BIODEGRADABLE POLY(P-DIOXANONE) DRUG DELIVERY SYSTEMS

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Abstract

Biodegradable polymeric systems with incorporated active pharmaceutical ingredients represent a promising approach for the development of advanced drug delivery systems and medical devices. This study focuses on the development and characterization of poly(p-dioxanone) (PDX) systems containing incorporated drugs, with emphasis on their degradation behaviour and drug-release characteristics.

The research aims to investigate changes in the morphology, microstructure, and mechanical properties of PDX-based materials during their hydrolytic degradation under simulated physiological conditions, together with the kinetics of drug release. As part of the initial experimental work, dexamethasone (DEX) was selected as the first model drug. Cast PDX/DEX samples are currently being investigated using UV–Vis spectroscopy to evaluate their dissolution and drug release characteristics. The sample microstructure is studied by means of scanning electron microscopy (SEM) and confocal light microscopy. Raman spectroscopy is employed to inspect the drug distribution within the material.

This contribution will provide an overview of the research approach and initial experimental results, focusing on dexamethasone release and the characterization of cast PDX/DEX samples. The data currently being obtained will serve as a basis for further investigations of PDX-based drug delivery systems, including the preparation and characterization of drug-loaded PDX filaments.

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