



Slovak Society of Chemical Engineering  
Institute of Chemical and Environmental Engineering  
Slovak University of Technology in Bratislava

## PROCEEDINGS

51<sup>st</sup> International Conference of the Slovak Society of Chemical Engineering SSCHE 2025

Hotel DRUŽBA  
Jasná, Demänovská Dolina, Slovakia  
May 27 - 30, 2025

Editors: Assoc. Prof. Mário Mihaľ

ISBN: 978-80-8208-158-2, EAN: 9788082081582

Published by the Faculty of Chemical and Food Technology Slovak Technical University in Bratislava in Slovak Chemistry Library for the Institute of Chemical and Environmental Engineering; Radlinského 9, 812 37 Bratislava, 2024

Gnatowski, P., Kucińska-Lipka, J.: Biodegradable active substances release systems, Editors: Mihaľ, M., In *51st International Conference of the Slovak Society of Chemical Engineering SSCHE 2025*, Jasná, Demänovská Dolina, Slovakia, 2025.

## **Biodegradable active substances release systems**

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**Key words:** polyurethane, curcumin, biodegradation, drug delivery systems

Many of the modern drugs developed to combat various diseases cannot be easily used in postoperative treatment due to difficulties in achieving therapeutic concentrations of active agents in the injured areas. This problem is particularly acute in places with limited access, such as the urinary tract, brain, or paranasal sinuses. In order to meet the needs of both patients and doctors, a biodegradable polyurethane-based implant and hydrogel agar-based coating were developed to be placed in the right place during surgery. Combination of modeling, mechanical (bending, compression), structural (FTIR), thermal (DSC, MFR), surface (contact angle), microscopic (optical), degradation (2 M HCl, 5 M NaOH and 0.01 M PBS) analysis, release of the active substance and cell viability (MTT) allowed to assess the suitability of the developed material for the production of implants. Obtained polyurethanes were characterized with high mechanical strength ( $\sigma > 20$  MPa), optimal biodegradability ( $> 10$  wt.% mass loss in 56 days), high release of hydrocortisone (up to solubility limit) and biocompatibility ( $> 80\%$  cell viability). The synthesized hydrogel coatings were also characterized with antimicrobial properties. However, before being used in clinical trials on humans, the developed materials must be first tested on animals to assess its impact on a living organisms.