

1 *Proceedings*

## 2 **Stability of the HPC/PU Polymeric Blends in** 3 **Accelerated Weathering and Biological Environments**

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9 **Abstract:** Polymeric blends of Hydroxypropyl cellulose (HPC) and Polyurethane (PU)  
10 (PU/HPC\_20/80; PU/HPC\_50/50; PU/HPC\_80/20) have been prepared by solvent (DMF)  
11 casting method and investigated after exposure to accelerated ageing conditions by using a  
12 mercury lamp ( $200 < \lambda < 700$  nm), at 60% humidity and 40 °C for 600 h. Their hydrolytic  
13 stability was evaluated after immersing them for 48 h in different pH (2.6 and 7.4)  
14 Phosphate-Buffered Saline (PBS) media. The structural changes in the composition of blends  
15 during the accelerated weathering and hydrolysis processes have been investigated by means  
16 of FT-IR (Fourier Transform Infrared) spectroscopy and DSC (Differential Scanning  
17 Calorimetry) analysis. FT-IR spectra of the blends after 600 h of irradiation and 48 h  
18 hydrolysis in PBS solutions revealed a major degradation process especially in the HPC  
19 component and in the soft segment of PU. The changes in the crystallinity of the blends have  
20 been also evaluated by FT-IR (by determination of Total Crystallinity Index (TCI) and  
21 Lateral Order Index (LOI)) and DSC that evidenced the reduction of the melting enthalpy  
22 ( $(\Delta H_m)$ ) and of its corresponding crystallization ( $T_c$ ) on heating/cooling runs indicated that  
23 ageing strongly affects the crystallinity of the PU/HPC blends.

24 **Keywords:** accelerated weathering; hydroxypropyl cellulose; polyurethane; blends; biological  
25 media; DSC; FTIR.

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27 **Aknowledgements:** This work was supported by a grant of the Romanian Ministry of Education  
28 and Research, CNCS - UEFISCDI, project number PN-III-P1-1.1-TE-2019-0604 and by project  
29 PN-III-P4-ID-PCCF-2016-0050, within PNCDI III.

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