



Polyethersulfone-co-polyesters blend ultrafiltration membranes for biomedical and biotechnological applications. Preliminary study

Andrzej Chwojnowski^{a,*}, Cezary Wojciechowski^a, Monika Wasyleczko^a,
Ewa Łukowska^a, Tomasz Kobiela^b, Piotr Dobrzyński^c, Małgorzata Pastusiak^c,
Anna Smola-Dmochowska^c

^a*Institute of Biocybernetic and Biomedical Engineering, PAS 02-109 Warszawa, Trojdena str. 4, Poland, emails: achwojnowski@ibib.waw.pl (A. Chwojnowski), wojciechowski@ibib.waw.pl (C. Wojciechowski), mwasyleczko@ibib.waw.pl (M. Wasyleczko), elukowska@ibib.waw.pl (E. Łukowska)*

^b*Faculty of Chemistry Warsaw University of Technology, 00-664 Warszawa, Noakowskiego str. 3, Poland, email: kobiela@ch.pw.edu.pl*

^c*Centre of Polymer and Carbon Materials, PAS 41-819 Zabrze, M. Curie-Skłodowskiej str. 34, Poland, emails: pdobrzyński@cmpw-pan.edu.pl (P. Dobrzyński), mpastusiak@cmpw-pan.edu.pl (M. Pastusiak), asmola@cmpw-pan.edu.pl (A. Smola-Dmochowska)*

Received 28 February 2020; Accepted 25 May 2020

ABSTRACT

Polyethersulfone (PES) L-lactide/glycolide/ε-caprolactone (LGC) terpolymer blend ultrafiltration membranes were prepared by non-solvent-induced phase separation method using macromolecular additives – polyvinylpyrrolidone and Pluronic® 127. The membrane forming mixtures were prepared by mixing two solutions: PES in *N*-methyl-2-pyrrolidone and LGC in tetrahydrofuran. The membranes before and after hydrolysis were characterized by: Fourier transform infrared, contact angle, scanning electron microscopy, atomic force microscopy, elemental analysis, hydraulic permeability, and cut-off point. The hydrolysis of LGC terpolymer component in the membranes was tested by the gravimetric method. The changes of properties of membranes due to the hydrolysis were investigated. Hydrolysis was carried out for 46 weeks. The cut-off point of membranes did not change significantly after hydrolysis. A significant increase in hydraulic permeability ranging from 32% to 48% depending on the membrane was detected.

Keywords: Polyethersulfone; Terpolymer; Ultrafiltration membrane; Blend membrane

* Corresponding author.