

# Influence of The Type of Soft Segment on Selected Properties of Polyurethane Materials for Biomedical Applications

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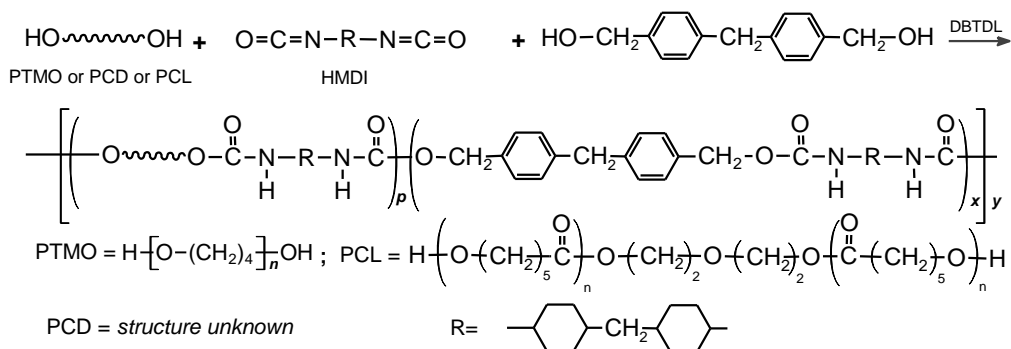
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The purpose of this work was to study the effect of used (polyether, polyester and polycarbonate) soft segment on structure, morphology, crystallinity and some physicochemical, thermal as well as antibacterial activity of new type TPUs. These polymers were synthesized from poly(oxytetramethylene) diols (PTMO)s of  $\overline{M}_n = 1000\text{Da}$  and  $\overline{M}_n = 2000\text{Da}$ , poly( $\epsilon$ -caprolactone) diol (PCL) of  $\overline{M}_n = 2000\text{Da}$  and polycarbonate diols (PCD)s of  $\overline{M}_n = 1000\text{Da}$  and  $\overline{M}_n = 2000\text{Da}$  as soft segments (SS), HMDI and unconventional chain extender [methylenedi(4,1-phenylene)]dimethanol (DMD). TPUs with hard-segment contents of 50 wt% were prepared by a one-step melt polymerization from DMD, HMDI and PTMO, PCD or PCL at the NCO/OH molar ratio of 1.05.



The resulting TPUs were high-molecular-mass materials with tensile strength in the range of 9.1–54.5 MPa and elongation at break in the range of 75–462%. Their glass-transition temperatures ( $T_g$ s) ranged from  $-73^\circ\text{C}$  to  $42^\circ\text{C}$ .

**Keywords:** polyurethane; biomaterials; antimicrobial activity