

## INFLUENCE OF *IN SITU* INTRODUCTION OF THE HETEROPOLYNUCLEAR COMPLEXES $Cu_3Mn$ ON THE STRUCTURE AND PROPERTIES OF CROSS-LINKED POLYURETHANES

*In this paper the structure, thermal, mechanical, dielectric and relaxation properties of cross-linked polyurethane (CPU), modified with heteropolynuclear  $Cu_3Mn$  complexes, were analyzed.*

*It was shown the amorphous structure of investigated CPUs with Bragg's orders which equal 0.44 nm. It was observed the increase of heterogeneity level and the formation of structures with relatively higher order of heterogeneity for modified systems. Bragg's orders were increased from 3.1 to 3.7 nm.*

*The immobilization of heteropolynuclear metals' complexes in polymer generally leads to decrease in the values of tensile strength and Young's modulus and to increase of elongation at break, compared with the corresponding values for the metal-free CPU.*

*There are four main stages the thermo oxidation degradation for the metal-containing CPUs. The modification in situ of CPUs with heteropolynuclear metal' complexes in some cases improves the thermal stability to 10°C.*

*Increasing temperature leads to an increase in the conductivity of the investigated systems.*

*The introduction of heteropolynuclear complexes  $Cu_3Mn$  in polyurethane leads to increasing of macro chains mobility and, as a result, to increase of conductivity level. This effect realized due to complexes formation between functional groups in polyurethane and heteropolynuclear metal' compounds. The level of dielectric conductivity at the direct current of modified CPUs were increased to 1.5–2 orders, compared with the corresponding level for metal-free CPU.*

*Key words: polyurethanes, heteropolynuclear complexes, order of heterogeneity, tensile strength, thermal stability, dielectric conductivity.*