

# Nanocomposites and nanomaterials

## Nanostructured copper-containing polyurethanes

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Immobilization *in situ* of metal chelate compounds in polyurethanes has resulted to nanoscale structuring of modified polymer. Such nanostructured metal-containing polyurethanes characterized by unique properties, such as optical, dielectric, mechanical etc.

The PU's SAXS profiles are characterized by the presence of one maximum with  $q_m$  positions varying from 1,7 to 2,0  $\text{nm}^{-1}$  (Figure 1). Such maximum points on the existence of changeover period of uniform density scattering elements and areas of uniform distribution of hard and flexible blocks in PU.

The Bragg's period ( $D$ ) for copper-containing polyurethanes equals 3,4-3,7 nm. For linear and cross-linked polyurethanes, modified with  $\text{Cu}(\text{acac})_2$ , the level of heterogeneity decreased with the increasing of the modifiers amount from 0,5 to 5% wt. (Figure 1).

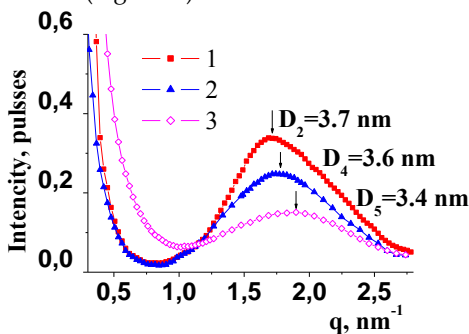


Fig. 1. The profiles of small-angle X-ray scattering data for linear polyurethanes, modified with  $\text{Cu}(\text{acac})_2$ : 0,5 (1), 3 (2) and 5% (3).

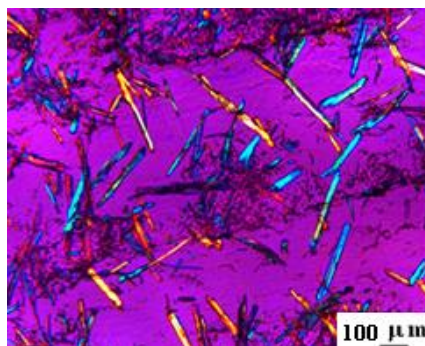


Fig. 2. Micro image of the film of linear polyurethanes, modified with 0,5%  $\text{Cu}(\text{acac})_2$ .

1. Kozak N., Lobko Eu. Bottom-up Nanostructured Segmented Polyurethanes with Immobilized Transition and Rear-Earth Metal Coordination Compounds. Polymer Topology – Structure and Properties Relationship // Polyurethanes. – 2012. – Ch. 4. – P. 51-78.