

Riga Technical University  
Faculty of Material Science and Applied Chemistry



# **ABSTRACTS**

of the  
**52<sup>nd</sup> International Scientific Conference  
of Riga Technical University**

Section:  
**Material Science and Applied Chemistry**  
October 13-15, 2011, Riga, Latvia

Riga 2011

## Nanostructured Carbon Black Filled Polyisoprene Composite for Pressure Sensing

Juris Zavickis, Alvars Kjapsna, Artis Linarts, Maris Knite, *Riga Technical University*

The last decade shows, that elastomer composite, filled with conductive nanoparticles, have supreme pressure sensing properties [1] and could compete with other pressure sensing materials. Our study shows that given material possess both: piezoresistive and hyper-elastic properties. The main idea of this work is to investigate electrical properties of the composite, depending on filler concentration and determine the conditions corresponding to the best piezoresistive effect.

The percolation threshold (Fig.1) and its critical parameters have been determined at first, as it is crucial for further investigation.

This has been done according to W.Bauhofer [2] and basic theory of statistic percolation. The piezoresistivity of the composite was determined at different filler concentrations. To evaluate microstructural changes of the composite under strain, we obtained time dependences of the resistivity under different loading conditions.

1. M.Knite, V.Teteris, A.Kiploka, J.Kaupuzs, *Sensor. Actuat. A* 110, 142 (2004)
2. W. Bauhofer, J.Z.Kovacs, *Compos. Sci. Technol.* 69, 1486 (2009)

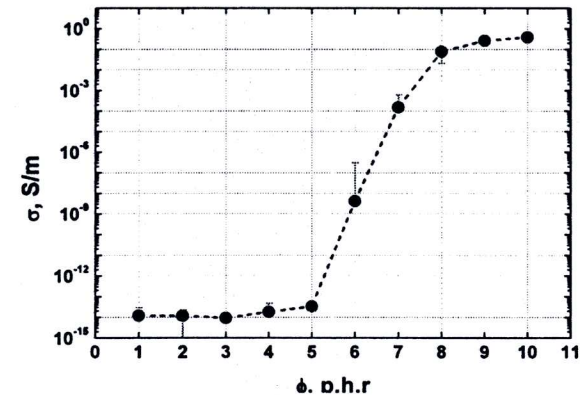


Fig.1 The dependence of the electrical conductivity of polyisoprene-nanostructured carbon black composite on the concentration of conductive filler.