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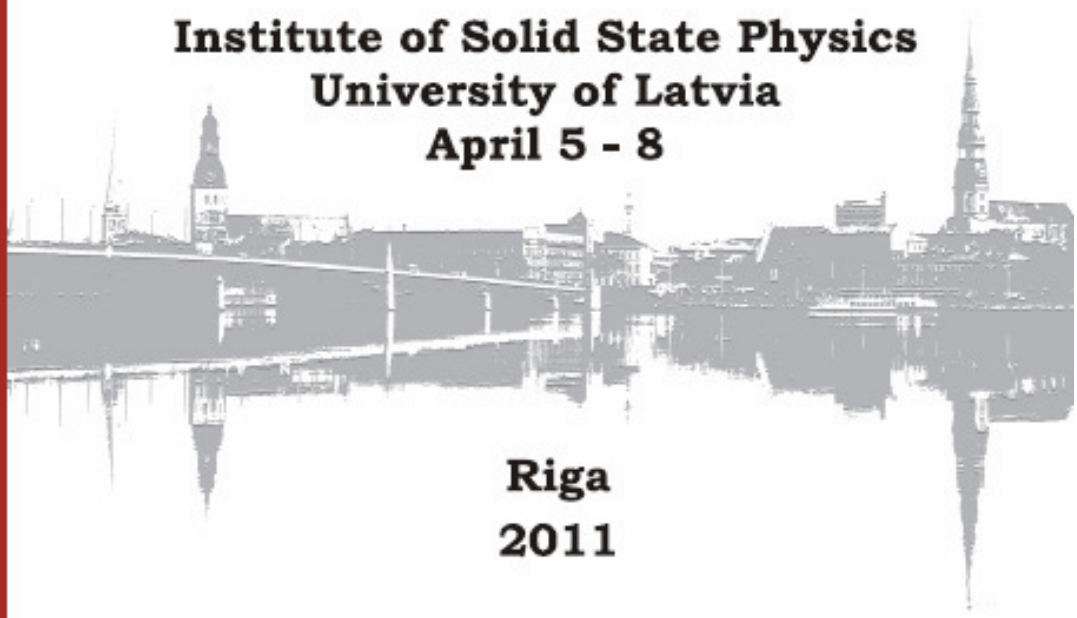

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FTIR and Raman Spectroscopy Studies of Polyisoprene-Nanostructured Carbon Composites

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Polyisoprene-nanostructured carbon composites (PNCC) are known for their potential use as piezoresistive and volatile organic compound sensors. For better theoretical understanding of physical and chemical processes taking place at different manufacturing stages of PNCC as well as for practical development of sensors with higher sensitivity, studies on optical properties of the composites were conducted. The goal of this study was to find out how the concentration of nanoparticles and vulcanization duration of polyisoprene – nanostructured carbon composites influence their optical properties.

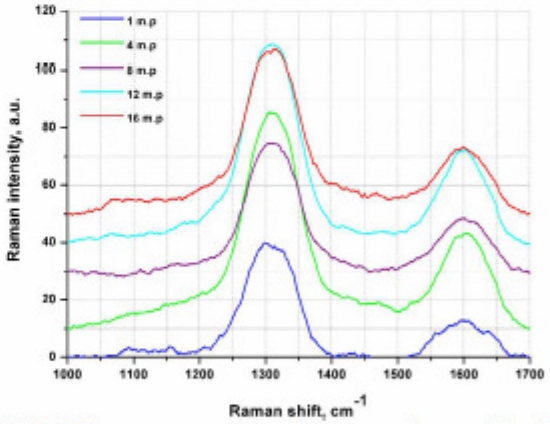

Fig.1 Raman spectra of composites with different concentration (m.p. – mass parts) of multi-walled carbon nanotubes.

FTIR spectroscopy was used to investigate the development of molecular bonds in PNCC samples with different vulcanization duration. These measurements have confirmed that, during vulcanization phase, chemical breaking and linking of molecular bonds takes place. The conducted measurements indicate a possible change of FTIR spectral peak height as aging process of PNCC samples takes place. In addition Raman spectroscopy measurements were made. Analysis of different peaks in FTIR and Raman spectra is carried out. Further optical studies are in progress.