Diploma thesis abstract

«Structure -sensitive changes in the terahertz absorption spectra of polymers and crystals»

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Absorption and refraction spectra were measured in the frequency range of 0.1-2.5 THz by terahertz time-domain spectroscopy method.

The influences of molecular crystal structures and temperature changes on absorption spectra were investigated by the example of corticosteroid hormone series. The nature of observed absorption bands for polycrystals was explained on the base of experimental and simulation data comparison.

One more goal of this work was the effective delivery of THz radiation by wave guiding structures. Technological samples and the most transparent polymers published in the literature were investigated in order to find a suitable polymer for waveguides.

The impact of monomer molecule length on absorption and refraction spectra of polymers was studied. Possibility of reducing of polymer absorption in THz range was analyzed.

Comparison of liquid monomer (styrene) and amorphous polymer (polystyrene) absorption spectra, and solution and polycrystal absorption spectra by the example of steroid hormone progesterone respectively was also carried out.

Absorption and refraction spectra of both corticosteroid hormone polycrystals and polymers were modeled at the frequency range of 0.1-2.5 THz.

A substantial impact of the hydrogen bond presence on absorption spectra both steroid hormones and polymers was suggested.