Title: Optical characterization of new materials for nonlinear optics

Author: František Pásztor

Department: Department of Chemical Physics and Optics

Supervisor: doc. RNDr. Petr Němec, Ph.D.

Abstract: Hyper-Rayleigh scattering is a method used to measure the value of hyperpolarizibility of the examined substance, which has a nonlinear optical response. The phenomenon which we observed is the generation of second harmonic frequency caused by the scattering of ultrashort laser pulse in the aqueous solution of the investigated substance. It's a noncoherent scatter and therefore the detected signal was very weak. We used a CCD camera for this experiment, which enables to detect small amounts of light. However the phenomenon of generation of second harmonic frequency was not the only one, multiphoton fluorescence was also present. Thanks to the experimental and processing methods we were able to separate these two phenomena from each other and therefore determine the value of hyperpolarizibility.