

Abstract:

Phosphorus is widely used in agriculture, where it promotes the growth of crops and increases the profitability of soil. Together with a growing world population, there is a dramatic increase in consumption of this important element. However, the global phosphate deposits are finite and are expected to be depleted in the next few decades. It is therefore important to find an effective way of recycling, which could be represented by single-celled microscopic algae. Microscopic algae are able to accumulate large quantities of phosphorus from the surrounding environment and to store this phosphorus, among others, in the form of polyphosphates. Polyphosphates are high-energetic biomolecules which are contained in the cells of plant as well as animal kingdom. They play a key role in a vast number of vital processes. Raman microscopy can be applied to study metabolism and distribution of biomolecules at a cellular level without the need of a special preparation of the specimen before the measurement. The subject of this bachelor thesis consists of development of methodologies that are needed for studying the accumulation and intracellular localization of polyphosphates in microalgae by means of Raman microscopy.