ABSTRACT

The aim of the diploma work was to examine the ability of strain A4 belonging to *Rhodococcus* to transform chiral α-substituted acrylonitriles, which are the precursors of building blocks for synthetic organic chemistry. The aforementioned strain produced a complex of enzymes – nitrile hydratase and amidase – enabling to transform nitriles into carboxylic acids with amides as intermediates.

The transformation of α-substituted acrylonitriles were carried out using whole cells of the bacterium or the partially purified nitrile hydratase. The reaction products were isolated and identified by spectral methods as the corresponding amides, acids or a lacton. The concentrations of the substrates and products in the reaction mixtures were monitored by reversed-phase HPLC. Original HPLC methods were worked out for this purpose, as well as the chiral HPLC methods, which were used to determined the enantiomeric purity of the chiral products.

The catalysts consisting of whole cells or the partially purified nitrile hydratase proved to be suitable for the preparation of α-substituted acrylamides and acrylic acids, some of which are intermediates for the synthesis of biologically active compounds.