**INTRODUCTION**

The biotransformation of readily available monoterpenes, such as R-(+) limonene and α-pinene, into more valuable terpenoids, is recognised as being of great economical potential to the food and perfume industry. The majority of the enzymes taking part in terpenes bioconversion belong to the cytochrome P450 family. This process can be realized by mimicking of the cytochrome P450 and related heme containing monooxygenases by means of porphyrin catalysis in solution required additional separation of used catalyst from reaction mixtures. Immobilisation of porphyrins in sol-gel cavities could be a solution of this problem. It has been assumed that immobilization of water-soluble porphyrins on an insoluble inorganic support prevents leakage to the hydrophobic solution. It is a good way to render them practicable, improve their stability, and constitute the first step in a continuous bioconversion.

**THE AIM OF STUDY**

The aim of the study was the biotransformation of R-(+) limonene and α-pinene to add value products in organic solvent by water-soluble cationic porphyrins. The following porphyrins: 5,10,15,20-tetrakis(1-methyl-4-pyridinio)porphyrin (H,TMePyP) and 5,10,15,20-tetrakis[4-(trimethylammonio)phenyl]porphyrin (H,TMePP), immobilized in silica gels obtained by sol-gel method were examined in the range of α-pinene biotransformation. The reaction products were directly analyzed by GC-FID and GC-MS.

**CONCLUSIONS**

1. Water-soluble porphyrins immobilized in sol-gel matrix show the activity in the biotransformation process of R-(+) limonene and α-pinene in organic environment.
2. Using such a catalytic system it is possible to obtain the valuable products applied in perfume and food industry as well as the components of pheromone traps.
3. Photochemical excitation of porphyrin catalysts is crucial for the catalyzed oxidation of monoterpenes.
4. The highest activity in this range show the free porphyrins, whereas its metal complexes considerably decrease the yield of biotransformation reaction.