

Synthesis of Oxygen Containing Monoterpenoids Based on Turpentine

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It has been known, that monoterpenic hydrocarbons (MH) with the general formula $C_{10}H_{16}$ (mainly α -pinene, β -pinene, camphene, Δ^3 -carene, dipentene) enter into the composition of the turpentine exudates by coniferous trees of *Pinaceae* species, growing in the Russian Federation. They are the unique renewable raw material for the synthesis of various products of value, including biologically active ones, that may find use in a great variety of branches of industry and national economy. From these products of value it is important to note oxygen containing MH derivatives such as alcohols, esters and ethers, ketones. Bicyclic MH derivatives are of the most interest from the biological activity point of view.

The synthesis of monoterpenic alcohols both of mono- and bicyclic structure with the high yield and the selectivity was performed upon oxidative-catalytic hydration of corresponding MH. The effective catalysts of bicyclic MH hydration are $HClO_4$ and phosphoro- or silico tungsten heteropoly acids (HPA) of the Keggin structure.

The high efficiency is also exhibited by HPA in the reaction of bicyclic MH with alcohols exhibiting a great variety three-dimensional structures. In particular, only on the basis of camphene more than 20 alkylbenzene bornyl ethers have been obtained.

Promising way of synthesis of oxygen contained MH derivatives is a specific oxidation of MH. As oxidizers $KMnO_4$, $(NH_4)_2S_2O_8$, HNO_3 , as well as oxidative system aluminium tertiary butylate – tertiary butylate hydroperoxide. As oxidizers $KMnO_4$, $(NH_4)_2S_2O_8$, HNO_3 , as well as oxidative system aluminium tertiary butylate – tertiary butylate hydroperoxide are considered.