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## Application of mesoporous materials to hydrogenation and Bayer Villiger oxidation of citral

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This work focus on hydrogenation and Baeyer-Villiger oxidation of citral using mesoporous materials such as: MCM-41, SBA-12 and SBA-16 containing niobium, tin and/or ruthenium. The aim of our study was to test and evaluate several aspects of a catalyst. Combination of different support materials and active sites should lead to the desired products selectively and in high yield. All of the synthesized mesoporous molecular sieves were active catalysts for the Baeyer-Villiger oxidation of citral. The results of this reaction showed that 2-hydroxy-2,4-dimethyl-hept-6-en-3-one is the main product, followed by cyclocitral (5-membered unsaturated aldehyde) and dihydromyrcenol. The best results obtained for NbSBA-12 (yield around 25%) in ethanol as reaction medium at 323K and SnSBA-12 at 373K in ethanol as reaction medium (yield ~ 20%). In hydrogenation of citral the influence of pressure, time of reaction, temperature, composition and structural/textural properties of the obtained materials on the conversion of citral to the desired products was determined. It was observed that the conversion of citral increased with temperature and pressure reaction alterations. The hydrogenation selectivity depends on reaction temperature, i.e., at high temperature the selective hydrogenation of the C=O group was much more difficult in the presence of C=C bond. The product of the first hydrogenation step, citronellal, was isomerized to isopulegol on the acid sites and further hydrogenated to menthol at longer reaction times. The increase in the polarity of the solvent increases the catalytic activity, however the reaction pathway was modified.

### Biography

Izabela Nowak is a Professor at the Faculty of Chemistry, Adam Mickiewicz University in Poznan (AMU). She wrote her MSc thesis at the University of Reading. She has been working in the field of catalysis and materials science for over 10 years. She has published numerous papers in the field of catalysis and materials science. She is currently working on the synthesis of new catalysts for the hydrogenation and Baeyer-Villiger oxidation of citral.

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