

INVESTIGATIONS OF CHEMICAL REACTIONS OF FAT COMPOUNDS UNDER MICROWAVE CONDITIONS

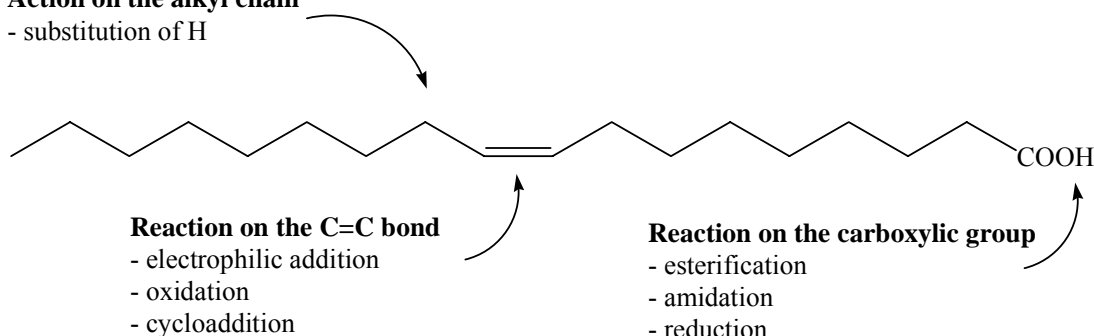
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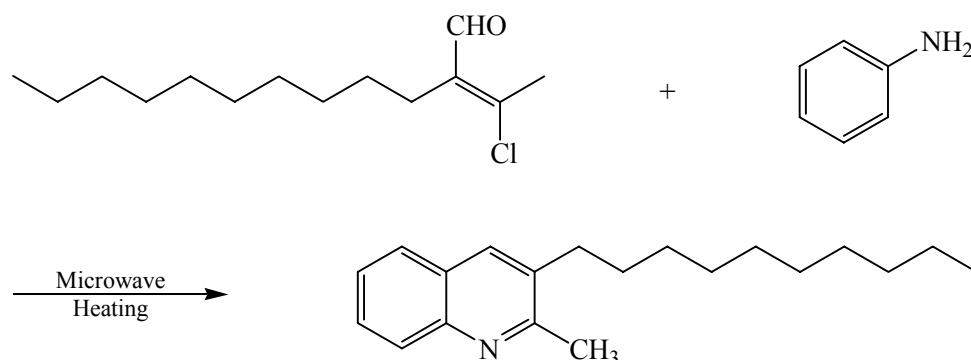
There is observed an increasing interest in applications of natural occurring fat compounds in the last few years. Modern chemical transformations of fats and oils shall lead to new applications of this class of renewable raw materials. Especially rap and sunflower as native and most cultivated oil plants are very important in this context. Chemical transformations of the fatty acids containing in the oils and fats give valuable key chemicals. The scheme shows the reactive positions of a fatty acid.

Action on the alkyl chain

- substitution of H



Many of such transformations need dramatical reaction conditions, long reaction times and the use of expensive catalysts. The nonclassical heating with the microwave technique used on chemical reactions of fat compounds allows to replace procedures that need much energy. We report about new applications of the microwave technology in the field of fat chemistry. Starting from commercially available fatty acids, fatty acid esters and fatty alcohols we investigated transformations into long-chain bromoalkanes, long-chain nitriles and long-chain diols and ketones. Further we report about perfluoroalkylation, transesterification, esterification and amidation reactions of fatty compounds under microwave conditions. The mentioned ketones are valuable building blocks [1] to synthesize heterocycles with long aliphatic parts at defined positions of the molecule as shown in the scheme.



References

[1] D. Greif, A. Fuchs in "Environmental Education, Communication and Sustainability", Vol. 21 (editors W. L. Filho, D. Greif and B. Delakowitz), Peter Lang Europäischer Verlag der Wissenschaften, Frankfurt/Main, 2006.