

## **Advances in the Synthesis of Alkenyl Succinic Anhydrides (ASA) of Vegetable Origin**

Florina STEFANOIU, Laure CANDY, Carlos VACA-GARCIA, Elisabeth BORREDON

Laboratoire de Chimie Agro-Industrielle UMR 1010 INRA/INP-ENSIACET

118 route de Narbonne, 31077 Toulouse Cedex 4, France

[Florina.Stefanoiu@ensiacet.fr](mailto:Florina.Stefanoiu@ensiacet.fr)

Alkenyl Succinic Anhydrides (ASA) are obtained by ene-reaction between an enophile molecule, maleic anhydride (MAH), and an unsaturated molecule, which is usually an olefin or, in our case, oleic or linoleic acid esters. Applications for ASA and vegetable ASA include surfactants, paper sizing, wood preservation and anticorrosion additives. In the preparation of alkenyl succinic anhydrides (ASA), also additives or a mixture of additives were used to improve the yield of the product and to reduce side-reactions.

Literature concerning the fundamentals of the reaction between MAH and petrochemical unsaturated molecules is abundant. However, few studies on the vegetable ASA have been carried out so far. The vegetable substrates are different from olefins according to their terminal ester moiety and to the double bond always located in central positions of the alkene chain.

In this work, the transposition of the double bond (*cis* to *trans*) was investigated by proton NMR. A kinetics study was performed to determine the rate constant (k) and to determine the overall order of the reaction. The influence of several additives (catalysts and side-reactions inhibitors) was evaluated. A systemic study of the influence of alkyl groups on the conversion rate and yield of the reaction was also carried out.

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