



Il Contributo dei Giovani Chimici in Campania

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Catalytic conversion of levulinic acid into esters with polyols

Vincenzo Langellotti ^{1*}, Giuseppe Campanile ¹, Maria Elena Cucciolito ^{1,2}, Roberto Esposito ^{1,2}, Massimo Melchiorre ^{1,2}, Francesco Ruffo ^{1,2}

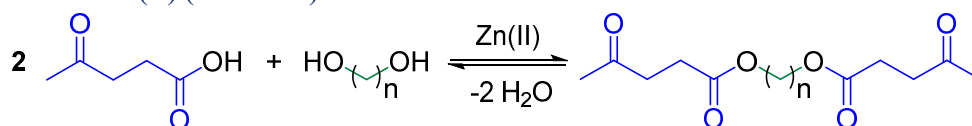
1 - Università degli studi di Napoli Federico II, Department of Chemical Sciences, Complesso Universitario di Monte S. Angelo, Via Cintia 21, 80126 Napoli, Italy)

2 - Consorzio Interuniversitario di Reattività Chimica e Catalisi, Via Celso Ulpiani 27, 70126 Bari, Italy

The growing demand for green-derived chemicals has oriented researchers' attention toward the conversion and valorization of biomass. One of the most interesting products from lignocellulosic biomass is Levulinic Acid (LA), which can be obtained in different ways, starting from raw materials made-up of glucose, fructose, sucrose, and other sugars. ^[1] LA is a platform compound for the chemical industry and is usually used as a precursor for pharmaceuticals, solvents, anti-freeze agents, and more. ^[2] Interesting derivatives are its esters (LE), which found applications as plasticizers, lubricants, and additives. Among these, esters of polyols are interesting compounds since key ingredients in industrial formulations. ^[3]

LE can be obtained by esterification reaction of LA with alcohols. This is an equilibrium reaction, with formation of water, and usually, the presence of a catalyst is needed to increase productivity. Over the years, different catalytic systems have been studied, but Lewis acids are becoming predominantly used. ^[4]

Zinc(II) salts and complexes already proved to be very active species in this type of reaction. Due to its low price and biocompatibility, this element is an interesting choice to obtain esterification catalysts. ^[5] In this work, the esterification reaction of LA with polyols was investigated in the presence of simple inorganic salt of zinc(II) (Scheme 1).



Scheme 1 – Esterification reaction of levulinic acid with polyols using Zn(II) inorganic salts. This study was also accompanied by NMR studies to evaluate the composition of the mixture.

Keywords: *levulinic acid, esterification, polyols, zinc(II)*

* Corresponding author: Vincenzo Langellotti, vincenzo.langellotti@unina.it

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