

Deep eutectic solvents: innovazione e sostenibilità nella chimica verde e nel trattamento della biomassa

Alberto Mannu, Ph.D.

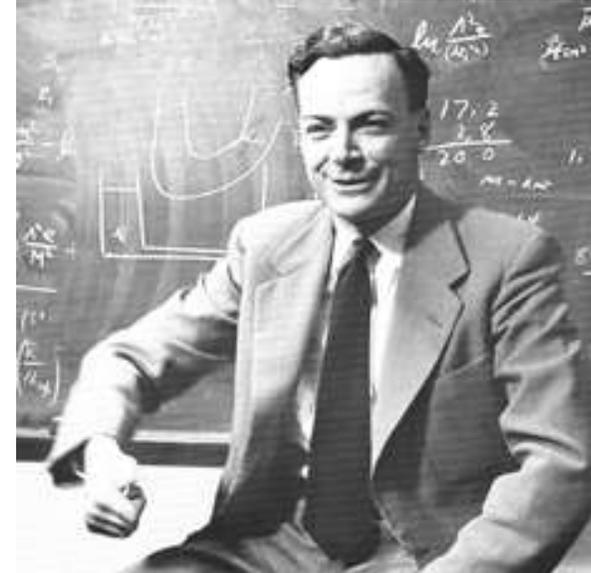
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Università degli Studi di Brescia

La suggestione di Feynman

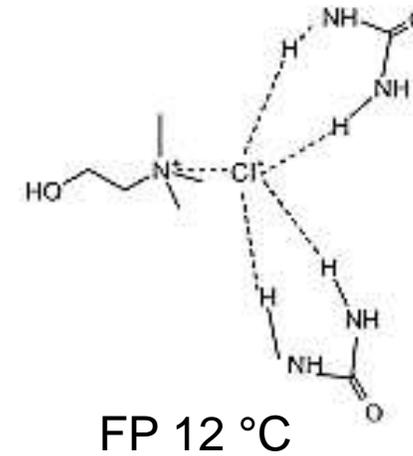
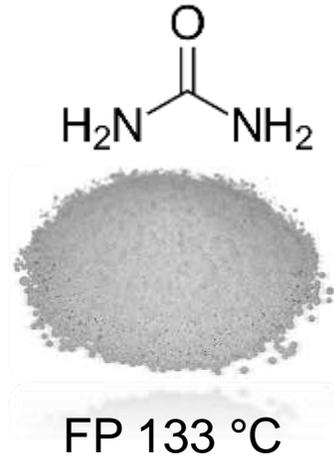
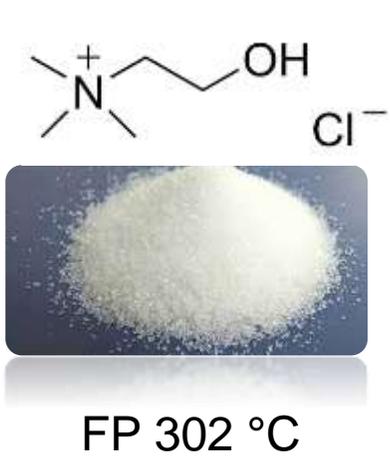
“What would the properties of materials be if we could really arrange the atoms in the way we want them?”

Richard Phillips Feynman, ACS Meeting 1959

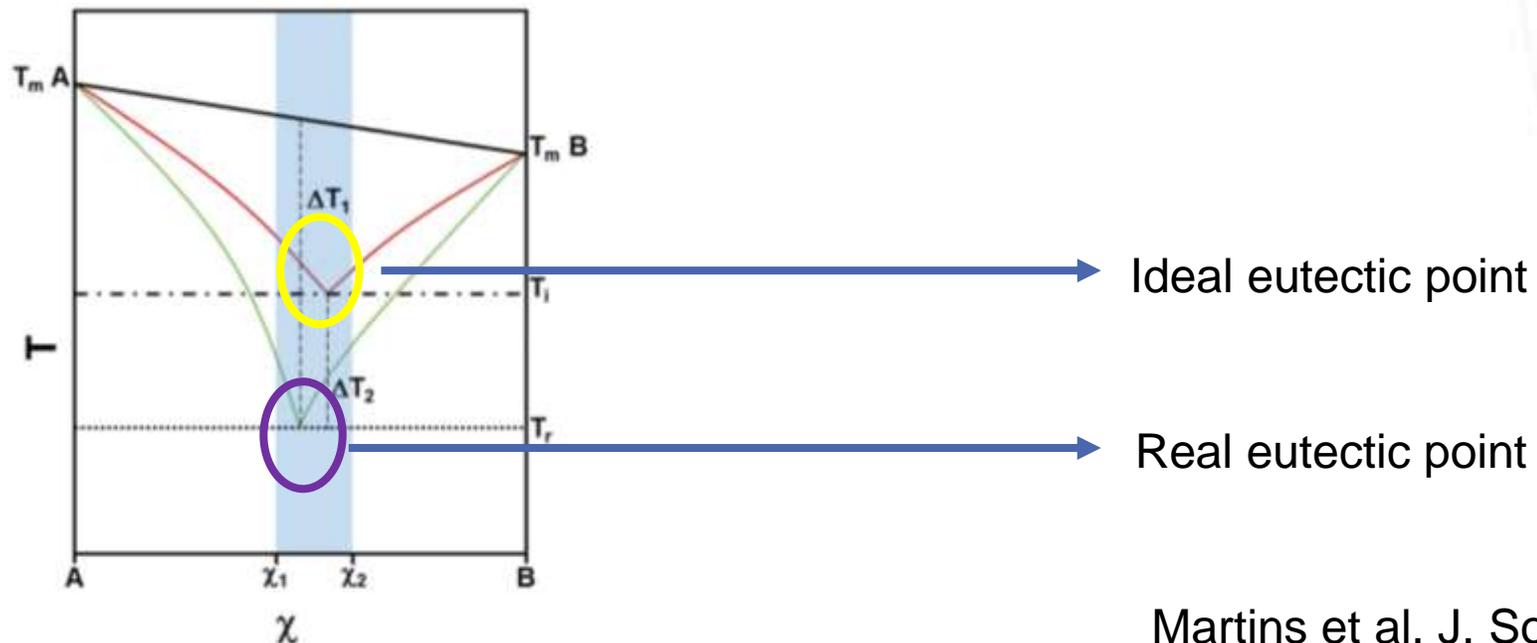


 Premio Nobel per la Fisica 1965

Colina cloruro:Urea – Il primo DES



Andrew P. Abbott,
Chem. Comm. 2003



Martins et al. J. Solut. Chem. 2019

HBD e HBA

Hydrogen bond donor ability

Capacità di donare legame ad idrogeno

Hydrogen bond acceptance ability

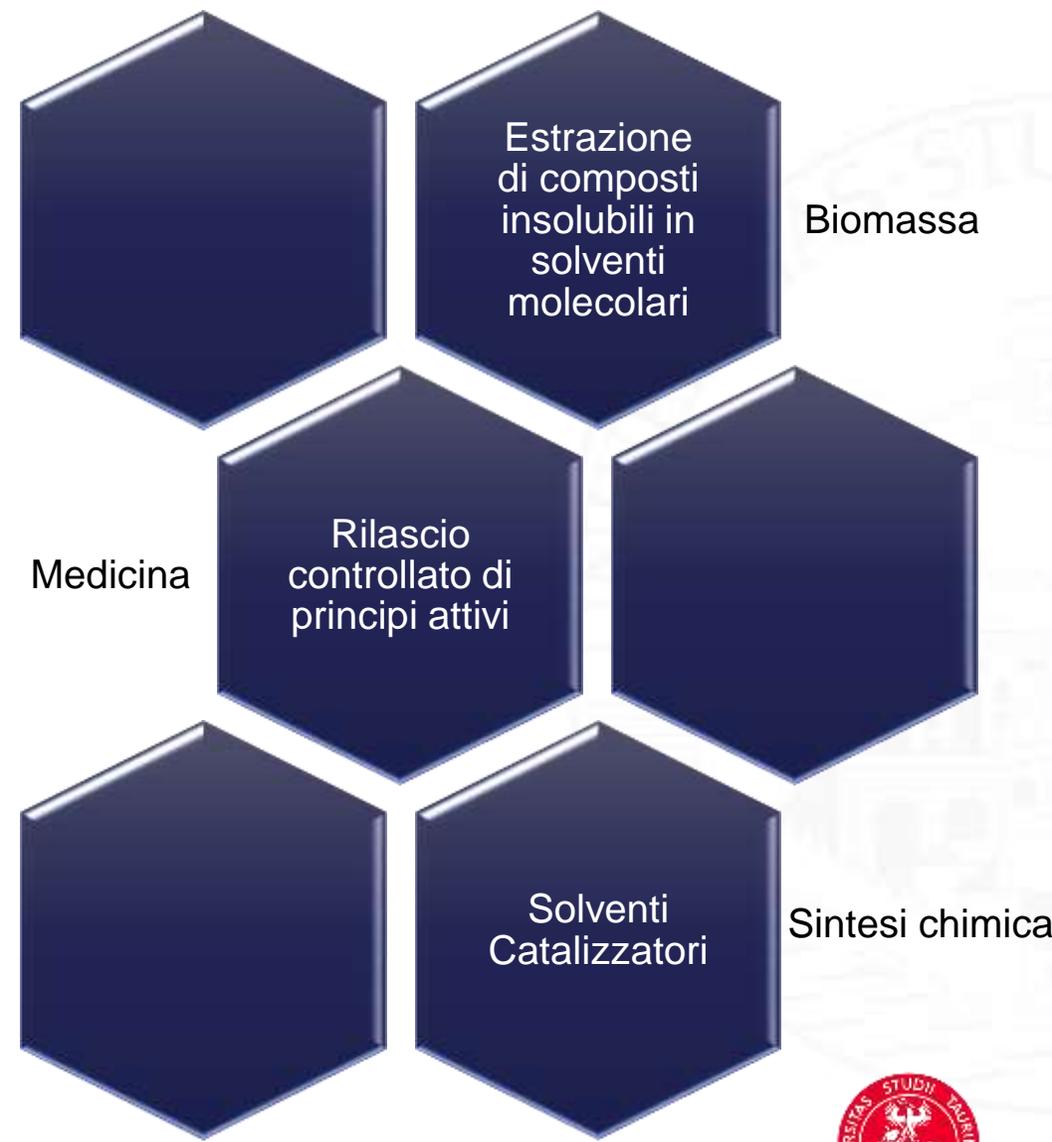
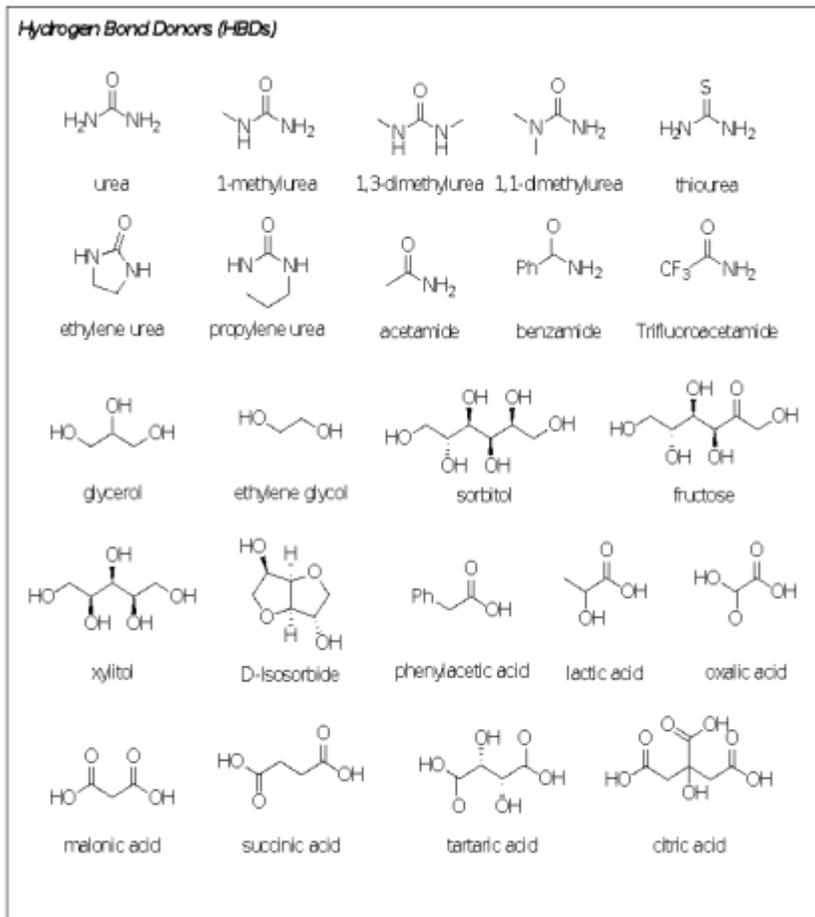
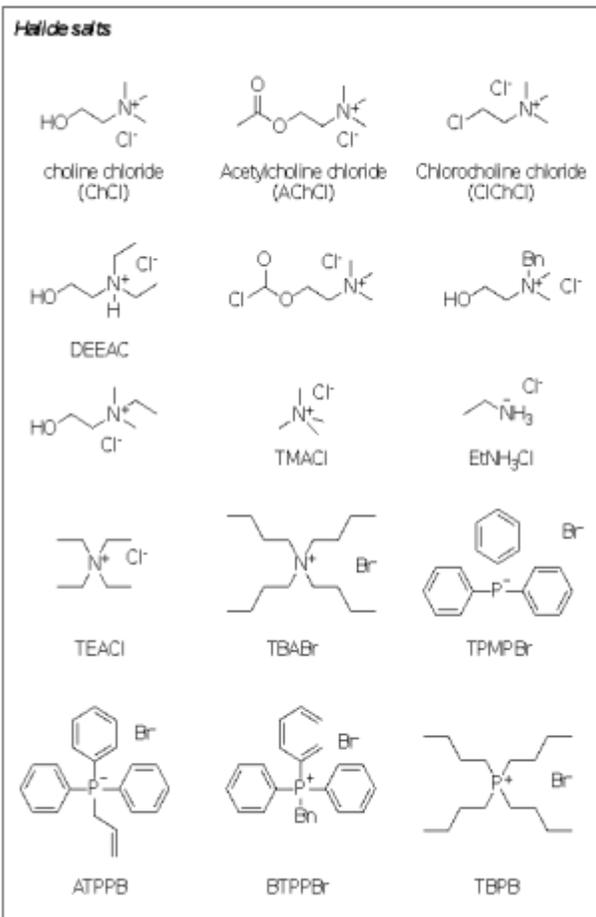
Capacità di accettare legame ad idrogeno

Il numero delle combinazioni è potenzialmente quasi infinito

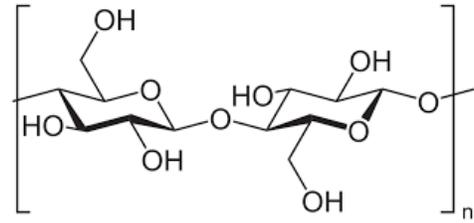
Progettando diverse combinazioni di HBD e HBA si possono regolare le proprietà del prodotto

Sistemi binari, terziari, idrofili, idrofobi, neutri, contenenti sali, etc...

Applicazioni

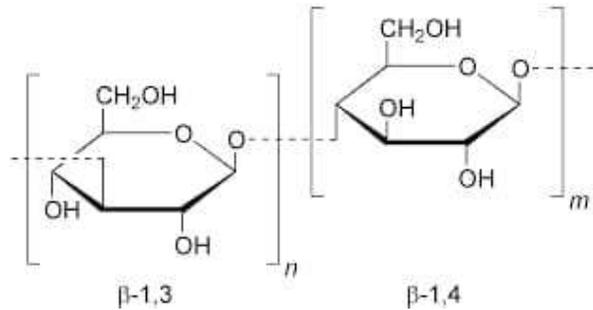
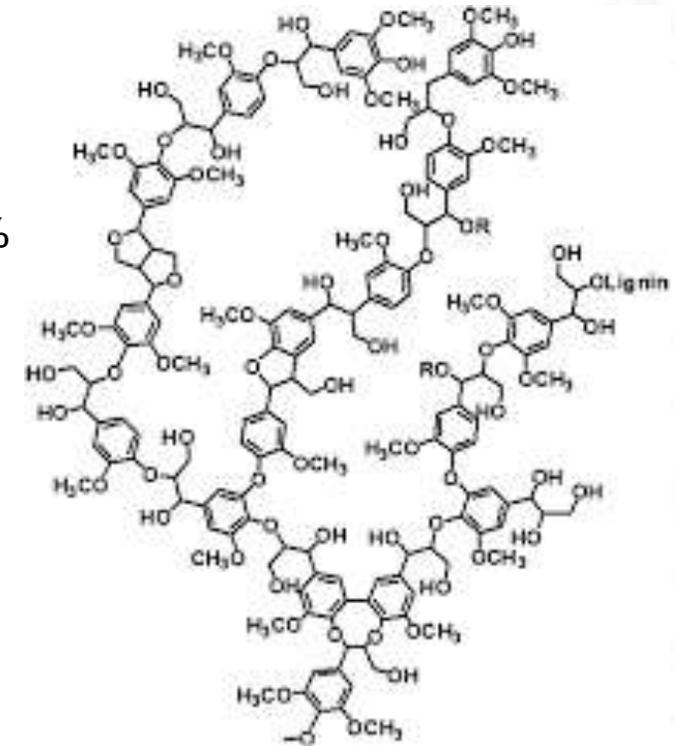


Trattamento della lolla del riso



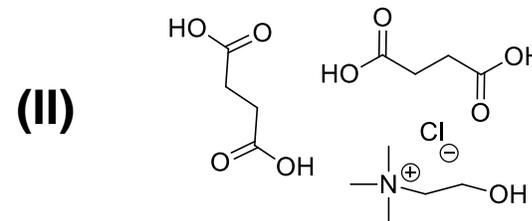
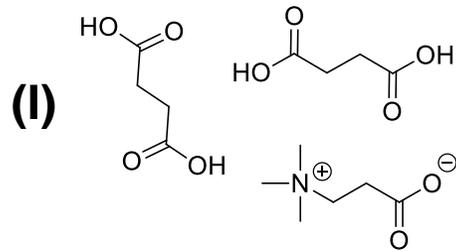
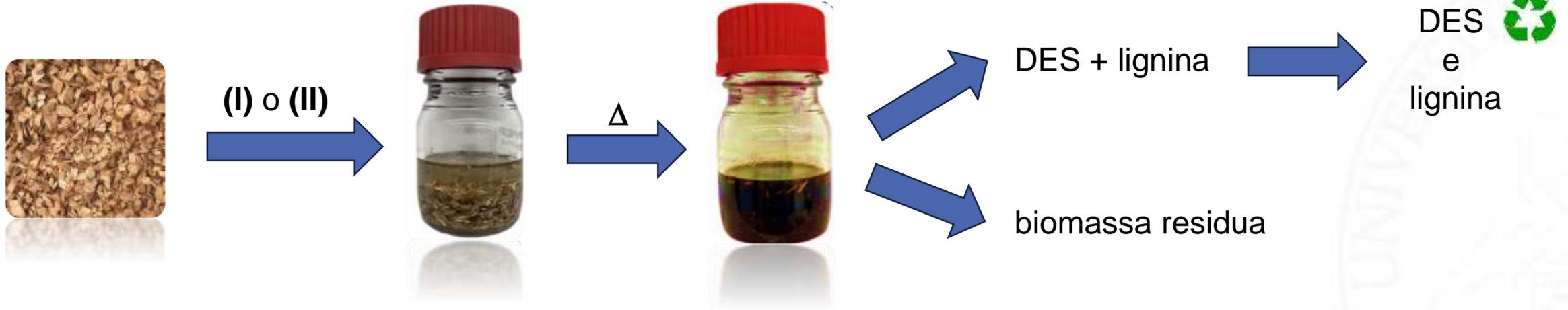
cellulosa
circa 35%

lignina
circa 20%



emicellulosa
circa 25%

Estrazione della lignina da scarti di legno di Eucalipto



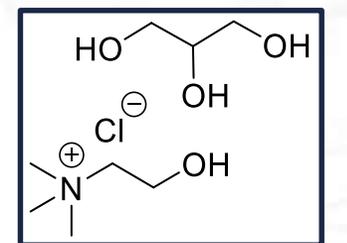
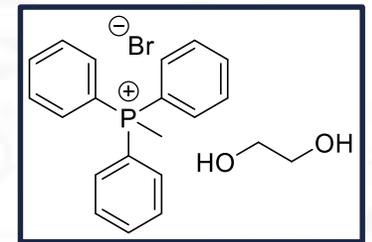
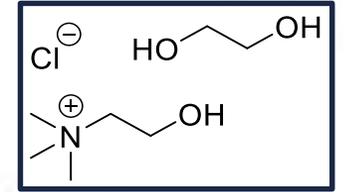
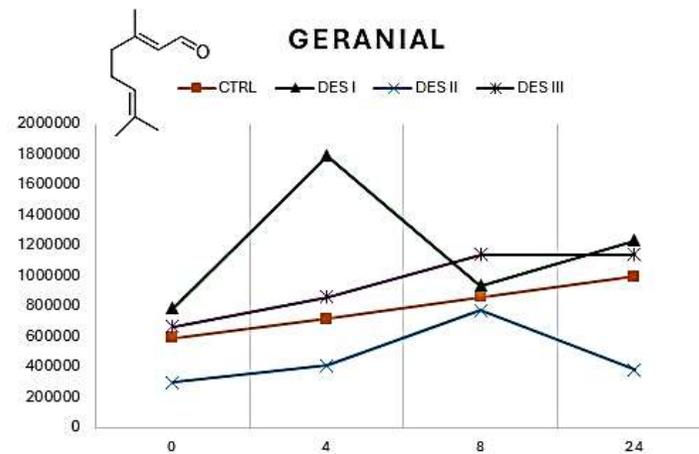
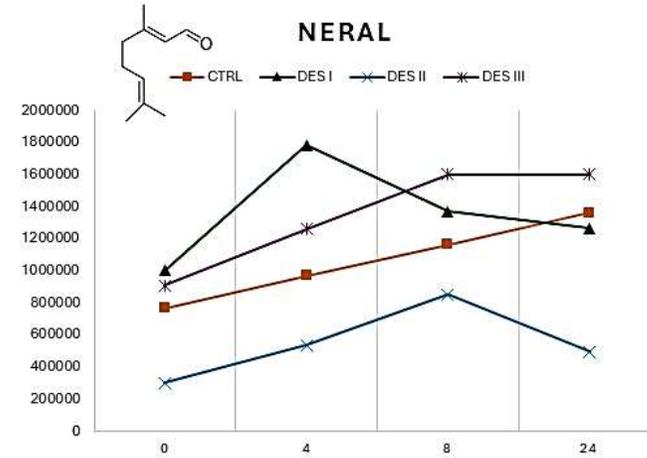
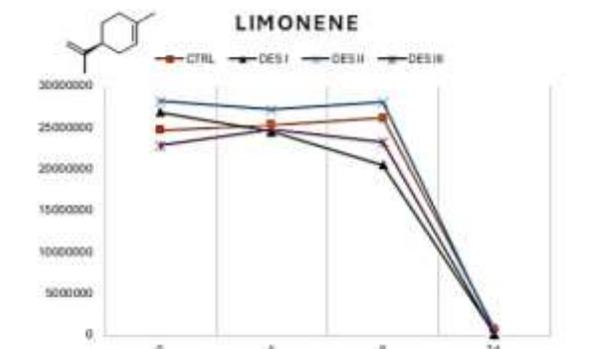
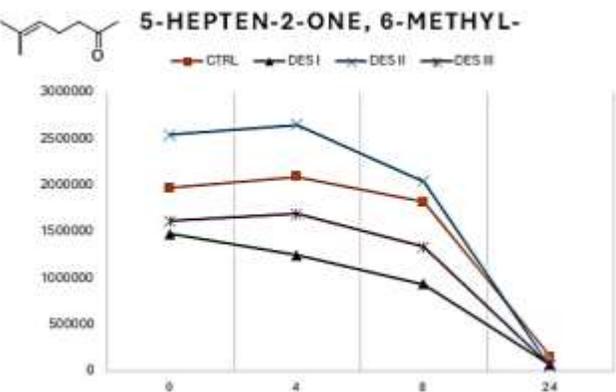
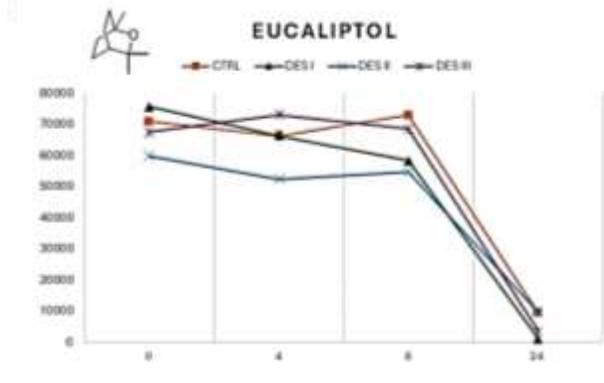
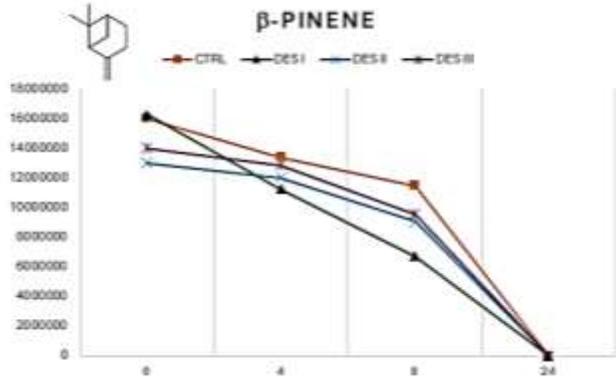
Packaging con proprietà antimicrobiche da biomassa alimentare



1) olio essenziale
2) DES



rilascio



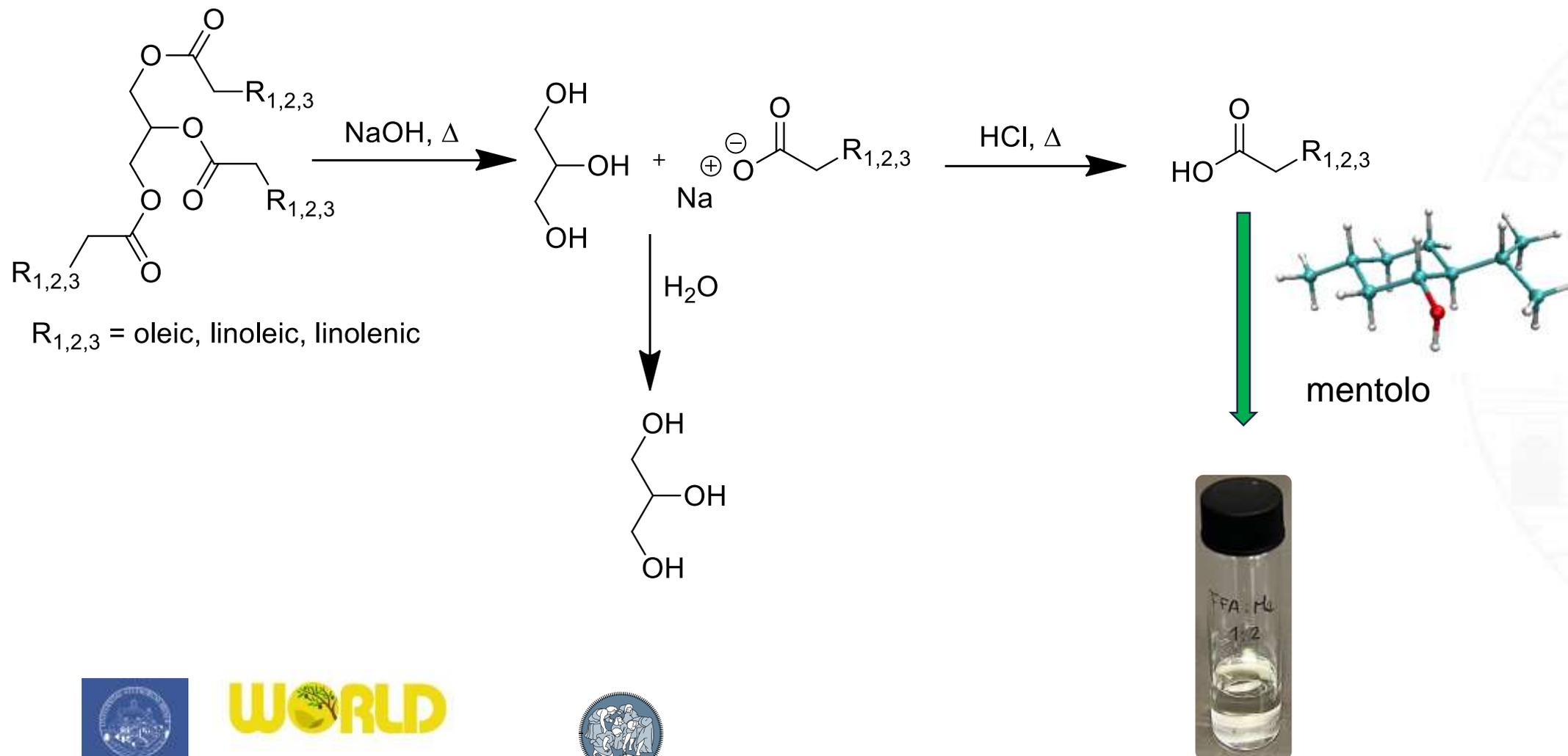
Mannu et al. Materials, 2020

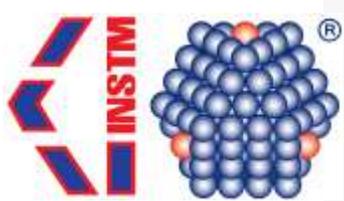


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Solventi eutettici da olio vegetale usato





WORLD



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