

**POLYMERS FROM RENEWABLE RESOURCES
FOR MACROMOLECULAR ENGINEERING
– OVERVIEW OF POLYSACCHARIDES**

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This seminar attempts to illustrate through an overview of polysaccharides, their extraction from natural origin as well as the preparation of interesting biomaterials thanks to their intrinsic properties.

Fossil resources are declining and their prices fluctuate with an overall tendency to rise. Therefore, the need to decrease greenhouse gas emissions and the industrial activities associated with their transformation into commodity chemicals and polymers which are often ecologically unsound. The necessity to use renewable carbon sources aimed at compensating the expected decrease of petroleum production. In the last few years, biopolymers from vegetable oils, lignin, sugars and polysaccharides and a series of other monomers were reported in important domains.¹

The concept of the biomass refinery has today gained a respected status which consists with developing systems capable of valorizing all the components of a given vegetable (*e.g.* maize) or animal (*e.g.* a crab) resource, where optimizing technical, economic and green issues, without going to the detriment of food and feed production.

Indeed, the synthesis of chemicals by biochemical conversion of platform molecules obtained in particular by fermentation and (bio)catalysis of biomolecules is presently the most widely envisioned approach.²

Some applications of main natural polysaccharides (cellulose, starch and chitosan), will be presented in order to report their interest in the field of materials. Especially, aerocellulose as an ultra-light and highly porous pure cellulose material³ and also wound dressing is one of the most promising medical applications for chitosan.⁴ Different uses of chitosan are studied in the form of scaffolds, fibers, hydrogels, ...

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3. R. Gavillon and T. Budtova, Aerocellulose: New Highly Porous Cellulose Prepared from Cellulose-NaOH Aqueous Solutions, *Biomacromolecules*, 2008, 9, 269–277

4. R., Jayakumar et al., Biomaterials based on chitin and chitosan in wound dressing applications, *Biotechnology Advances*, 2011, 29, 269–277