

## ECO-FRIENDLY POLYMERS FOR FOOD PACKAGING, GREEN BUILDING AND COATING APPLICATIONS

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This research field is mainly focused on the synthesis and characterization of novel bio-based polymers and copolymers which offer physico-chemical properties suitable for the desired application. An alternative approach consists in the chemical modification of commercially available polymers to make them attractive for different uses.

Regardless of the synthetic approach adopted, the main goal is to find out structure-properties relationships of main interest for designing a material which completely fits the requested specifications. As an example, green food packaging materials must accomplish basic requirements to be an ideal candidate for food, which includes barrier properties (water vapor, gases, light and aroma), optical properties (transparency), strength, welding and molding properties, disposal requirements, antistatic properties and, above all, strictly follow food safety.

Copolymerization as well as physical and/or reactive blending approach are an effective way of achieving a deliverable combination of properties, which are often absent in single component polymers. Moreover, the final properties of the material can be favorably modified, depending on the kind, relative amount, distribution and architecture of the comonomeric units or, in the case of mixture, by properly varying the homopolymers and blend composition. The choice of the monomers to be used in the polymerization process as well as of the comonomeric unit to be introduced along the polymeric chain of the parent homopolymer will be made on the basis of the requirements that the materials have to satisfy.

The so synthesized polymers are fully and deeply characterized both using the technology available in the DICAM labs and through collaborations with other research groups.

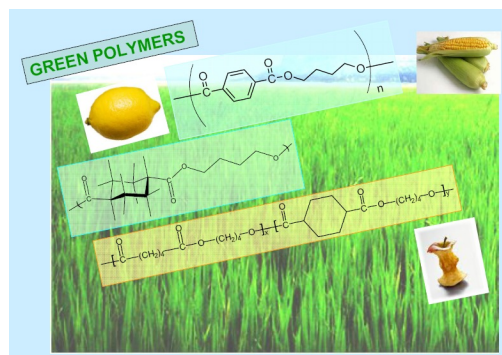


Fig. 1 Examples of polymers obtained by biomass (figure by A. Celli)

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