(Bio)Degradable Polymers from Renewable Resources

Ann-Christine Albertsson

Fibre and Polymer Technology, School of Chemical Science and Engineering, Royal Institute of Technology, SE-100 44 Stockholm, Sweden

During the last years, the interest in renewable and biodegradable materials has increased tremendously in the global community. The global market for renewable and biodegradable materials is anticipated to increase immensely in the near future following the raising societal awareness of the climate situation and the expected results of a continued consumer mentality. Still, the use of renewable and biodegradable materials has not been realized to any significant extent and few really renewable materials are available on the market.

Increasing the fundamental knowledge of the degradation and environmental interactions of materials based on renewable and biodegradable polymers are the keys to fulfilling the increasing demand of new materials. There is also a need for new materials and more discriminating tools to predict the safety and degradation performance of the new materials throughout the life cycle of the material and products. Indicator products and chromatographic fingerprinting are thus powerful tools for the degradation state prediction [1-3]. The material should have right mechanical properties and, if degradable, a suitable degradation time for the given application and it should totally degrade to non-toxic water soluble degradation products. The environment where the material is going to be used has a large influence on the degradation and release rate. Materials of the future need to be developed and made to function in all aspects of its existence, including production, use and waste management.

Forestry and agricultural biomass holds huge potential as a renewable source of reactants and materials, being cheap and abundant. Hemicelluloses present such a material group, available for the production of functional materials, mainly hydrogels [4] and barrier films [5-6]. PLA is another interesting candidate and one of the very few polymeric materials today that are available from renewable resources, e.g. by fermentation of agricultural waste.

Keywords: degradable; bioresorbable polymers; renewable, green materials

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