

## **Polyacrylates in Poly (Lactic Acid) Matrix, New Biobased Polymer Material**

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**Abstract :** Poly (lactic acid) is well known polymer, often called green material because of its origin (renewable resources) and biodegradability. This biopolymer can be used in the packaging industry very often. Poor resistance to permeation of gases is the disadvantage of poly (lactic acid). The permeability of gases and vapor through the films applied for packages and bottles generally should be very low to prolong products shelf-life. We propose innovation method of PLA gas barrier modification using electromagnetic radiation in ultraviolet range. Poly (lactic acid) (PLA) and multifunctional acrylate monomers were mixed in different composition. Final films were obtained by photochemical reaction (photocrosslinking). We tested permeability to water vapor and carbon dioxide through these films. Also their resistance to UV radiation was also studied. The samples were conditioned in the activated sludge and in the natural soil to test their biodegradability. An innovative method of PLA modification allows to expand its usage, and can reduce the future costs of waste management what is the result of consuming such materials like PET and HDPE. Implementation of our material for packaging will contribute to the protection of the environment from the harmful effects of extremely difficult to biodegrade materials made from PET or other plastic

**Keywords :** interpenetrating polymer network, packaging films, photocrosslinking, polyacrylates dipentaerythritol pentaacrylate DPEPA, poly (lactic acid), polymer biodegradation

**Conference Title :** ICMMPE 2015 : International Conference on Materials, Minerals and Polymer Engineering

**Conference Location :** Prague, Czechia

**Conference Dates :** July 09-10, 2015