Jeimmy C Ibarra et al., J Material Sci Eng 2017, 6:2 (Suppl)
http://dx.doi.org/10.4172/2169-0022.C1.062

Effect of different diisocyanates on the cytotoxicity and degradability of polyurethanes based on castor oil

Jeimmy C Ibarra, Manuel F Valero, Yomaira L Uscategui and **Luis E Diaz**
Universidad de La Sabana, Colombia

In fields such as biotechnology, it has emerged the need to use materials that help improve current devices and medical procedures. For this reason, new biodegradable polymers with specific properties are increasing their demand. Among the types of polymers used for such purposes, polyurethanes are notable for their versatility and ability to obtain products with a wide range of physical and mechanical properties. In the current work, the effect of the NCO/OH stoichiometric ratio and the chemical structures of hexamethylene (HDI), 1,4-cyclohexane (HMDI) and toluene (TDI) diisocyanates on degradability, cytotoxicity and physicochemical and mechanical properties of polyurethanes obtained from castor oil were studied. Water absorption tests and contact angle measurements were performed to determine the hydrophobic character of the materials; it was found that as the stoichiometric ratio, the flexibility and the intermolecular forces increase, the material is more hydrophobic (TDI>HDI>HMDI). The low absorption capacity is attributed to the hydrophobic nature of the castor oil. An *in vitro* degradation test was performed for 12 weeks, showing a low percentage of weight loss, directly related to the low diffusion of water within the matrix. MTT assays were used on a mouse fibroblast cell line L929, indicating that the polyurethanes with the NCO/OH stoichiometric ratios of 1.0 have a cell viability greater than 60%, being considered materials with low cytotoxicity, which can be used for biomedical applications.

Biography

Jeimmy C. Ibarra is a chemical engineer and student of Master in Design and Process Management with emphasis in Chemical Processes of the University of La Sabana, Chia, Colombia. He has focused his research in the area of biomaterials with biomedical applications, specifically in polyurethanes synthesized from higuerilla oil as a possible substitute for conventional polyols. This approach responds to the topics of interest of the Energy, Materials and Environment Research Group (GEMA), of which she is a member.

jeimmyibch@unisabana.edu.co

Notes: