

31ST MATERIALS SCIENCE AND ENGINEERING CONFERENCE: ADVANCEMENT & INNOVATIONS

October 15-17, 2018 Helsinki, Finland

Compatibilization of polypropylene and recycled polyethylene terephthalate blends with methacrylate glycidyl based copolymers

Arménio C Serra, Mafalda F Lima, Áurea A T Matias, João R Costa and Jorge F Coelho
University of Coimbra, Portugal

Polyethylene Terephthalate (PET) is a very versatile polymer mainly used in the manufacture of bottles for water. Due to its rigidity, oxygen barrier effect and thermal stability PET can improve the mechanical and thermal properties of other common polymers (polyolefins), if efficiently blended. Also, recycled PET is available in the market large amounts. Polypropylene (PP) is one of the major polyolefins produced worldwide used in a variety of articles from packaging to fibers. With relative low price, its uses could be expanded if some modifications of its mechanical properties are achieved. One of the possibilities is the use of blends with polymers or particles that could improve the PP mechanic weaknesses. The major difficulty to surpass is the compatibilization process between the immiscible and polar polyester and the apolar polyethylene. In order to improve blending process two major strategies to create covalent bonds between the two polymers were described by using PP grafted glycidyl methacrylate or maleic anhydride grafted PP. These are the routes followed by the commercial compatibilizers. In this work, we synthesized copolymers containing different amounts glycidyl methacrylate and ethyl-hexyl acrylate and evaluate the effect of these copolymers on the compatibilization of polypropylene and recycled PET. The effect of the synthesized copolymers in the mechanical and thermal properties of the blends will be discussed.

Biography

Arménio C Serra has completed his study in Biochemistry from the University of Coimbra and has completed his Doctorate in Organic Chemistry. His research area includes sulfonyl radical reactions, synthesis of porphyrin macrocycles as photooxidation catalyst, photodynamic therapy, supported organic catalysts for carbon-carbon condensation reactions and carbon dioxide activation. Presently, he is the Professor of the Engineering Chemical Department in Coimbra University. His research topics are centered on the study of polymerization processes and in the use of biomolecules in material science.

aserra@eq.uc.pt

Notes: