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# Polysorb®-A Versatile Monomer for Improving Thermoplastics and Thermosetting Properties: Case Study of Polyesters

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**Abstract :** Isosorbide or 1,4-3,6 dianhydrohexitol has been developped for several years as a new biobased monomer. It is commercially available as a starch derivative, more precisely obtained derivated from starch and more precisely from sorbitol. Isosorbide can find several applications, directly as a monomer or after chemical modification, in different polymer fields like thermoplastics (obtained from polycondensation or from radical polymerization of unsaturated monomers) or like Thermosetting resins (like cross linked PU, or after modification like acrylates or epoxy coatings) Concerning aliphatic or semi-aromatic polyesters, the addition of isosorbide improves thermal stability an,d optical properties, allowing a large range of applications as semi-crystalline or amorphous polymers. The preparation of poly (ethylene-co-isosorbide) terephthalate with different ratios of isosorbide will be particularly detailed. The structure – properties relationship will permit a focus on the obtention of polyesters with semi-crystalline or amorphous structures. The influence of isosorbide on the polymerization, on the processing of the resulting polyester as well as the modification of the final properties will be enlightened. The properties of Poly (ethylene-co-isosorbide) terephthlate will be emphasized and related to their applications. The evolutions related to Isosorbide with the replacement of ethylene glycol by Cyclohexanedimethanol allowed to drastically change the properties of the resulting polyester, with a large gap on the properties and new potential applications.

**Keywords :** modified PET, poly(ethylene-co-isosorbide)terephthalate, specialy polyester, poly(isosorbide_co_cyclohexanediol)terephthalate
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