

# Perfluoropolyether-based Polyester Triblock Copolymers as Hydrophobic/Oleophobic Additives to Thermoplastics

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**Abstract:** Our goal has been to synthesize and characterize novel oleophobic fluorinated copolymers that can be used as low surface energy additives to engineering thermoplastics. With this in mind, we synthesized original perfluoropolyethers (PFPE)-based polyester triblock copolymers (FBCs) containing different macromolecular segments. The copolymers do not contain long-chain perfluoroalkyl segments, which are toxic and persistent in environment. In our study, first PFPE-based oligomeric polyesters (FOPETs) were synthesized. Then, to improve the compatibility of the materials with polyethylene terephthalate (PET), we synthesized polyethylene isophthalate (PEI) telechelic oligomer and reacted the oligomer with FOPET utilizing reactive end-groups to obtain triblock copolymers. In the copolymers, PEI was served as a middle block. After FBCs were obtained, they were blended with PET and other important thermoplastic polymers to fabricate films. The surface properties of the films modified with FBCs (such as surface morphology, composition, and wettability) were investigated using atomic force microscopy, X-ray photoelectron spectroscopy, and contact angle measurements. We found that the addition of FBCs to thermoplastic films, even at relatively low concentrations, can significantly increase the films' water and oil repellency. Therefore, the materials can be considered as the replacement of additives containing long-chain perfluoroalkyl substances.