Title (5)	:	**Exploring the Exceptional Properties of Polypropylene/Polystyrene-grafted-Natural Rubber (NR-g-PS) Blends**
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Abstract	:	Polystyrene was grafted onto deproteinized natural rubber (DPNR) using melt-mixing and graft copolymerization procedures, respectively, before being blended with polypropylene (PP). The effects of these methods on the morphology and mechanical behavior of the resulting blends were then examined, along with the loading requirements necessary to obtain the desired blend attributes of the polystyrene-grafted natural rubber (NR-g-PS). At a 20% NR-g-PS loading in the PP-matrix, Polypropylene (PP), which was previously a stiff and strong thermoplastic, was successfully modified into a more stiff and tough thermoplastic elastomer in accordance with the nature of the obtained stress–strain properties. Tensile strength (TS) and modulus (E) of blends were shown to decline, however elongation at break (EB) increased with increased NR-g-PS loading. Unmodified PP had flexural strengths and modulus of 45.9 and 1475.6 MPa, respectively; these values decreased with increasing NR-g-PS loading. Impact strength of unmodified PP was 25.8 kJ/m2, whereas impact strength of materials containing 10, 20, 30, and 40% NR-g-PS was 33.9, 35.2, 29.7, and 16.0 kJ/m2, respectively. Unmodified PP had a melt flow index (MFI) of 14.1, while loadings of 10%, 20%, 30%, and 40% NR-g-PS resulted in values of 19.4, 20.7, 12.3, and 7.6 g/10 min. Loading of 20% NR-g-PS in PP-matrix produced the best combination of mechanical characteristics. Adhesion sites, a sign of high compatibility, were visible in SEM images of specimens with surfaces that had been tensile fractured. Impact strength was improved overall by 37% using the produced thermoplastic elastomer.