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Effect of ZnO and TiO2 on Properties of Polystyrene/Nitrile Rubber Electrospun Fiber Mats

This research is aimed to study the effect of zinc oxide (ZnO) and titanium dioxide (TiO2) on mechanical and antibacterial properties of PS/NBR electrospun fibers. 15 wt% of polystyrene (PS) blended with nitrile rubber (NBR) at 50:50 w/w is dissolved in tetrahydrofuran prepared PS and NBR solution. ZnO and TiO2 are added into PS/NBR solution at 1.0, 2.0 and 3.0 wt%. The addition of 2.0 wt% of ZnO into PS/NBR electrospun fibers maximized Young's modulus and tensile strength. For the effect of TiO2, increasing content of TiO2 up to 1.0 wt% increased Young's modulus and tensile strength of PS/NBR electrospun fibers while addition of TiO2 beyond 1.0 wt% decreased the Young's modulus and tensile strength. The percentage strain at break is also decreased as the content of ZnO and TiO2 increased. Moreover the anti-bacterial properties, it found that the addition of 2.0 wt% ZnO the fibers inhibited the growth of E. coli and S. aureus.

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