

Effect of dispersant agent on the properties of composites prepared with poly(lactic acid) and Stipa Tenacissima fiber

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Abstract. The growing concern about environmental problems has accentuated interest in the use of biomass developing sustainable materials and for development of polymeric composites. Indeed, the trend toward biobased materials is not only interesting in terms of environmental impact but also constitutes an alternative solution to fossil based materials. In this study we investigated the mechanical and thermal properties of poly (lactic acid) (PLA) composites reinforced with alfa fiber. To improve the performance of composite, it is necessary to modify the surface of the fiber using a dispersant agent. The raw fiber was treated with the BYK W-980 at the content of 2% and 3.3%. Composites were prepared by twin-screw extrusion followed by compression molding. The mechanical properties were evaluated through flexion test, the morphology of materials is also studied. The investigation is conducted for the pure PLA and composites containing 20% of the lignocellulosic fiber. The mechanical properties of PLA and composites indicate that surface treatment leads to an increase in flexural modulus. The use of the dispersing agent enhances the dispersion state of rigid fiber which prevents the movement of PLA chains and increases the modulus. This result is confirmed by SEM analysis. The treatment effect of fiber is more pronounced using 2% BYK W-980.