



MECHANICAL PROPERTIES AND MORPHOLOGY OF POLYSTYRENE COMPOSITES REINFORCED WITH WASTE COTTON FIBERS OF THE TEXTILE INDUSTRY

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The use of raw materials from renewable resources has been the focus of interest in many research because of its great potential in replacing traditional materials. The use of these can be seen as an economic and social practice, but most important is the tendency to reduce the use of products with hard breakdown. The use of vegetal fibers as reinforcement in polymeric composites offer great potential to improve the performance of polymers in technological applications, besides presenting low cost, low density, abundance and biodegradability compared to synthetic. The aim this work is to use waste cotton fibers from the textile industry as reinforcing material in polymeric composites using polystyrene resin as matrix and poly (styrene-co-maleic anhydride) coupling agent. The percentage mass of fiber used were 0, 10 and 20 wt %, divided into two groups, with and without coupling agent. The composites were developed by first mixing in a single screw extruder and a co-rotation parallel twin screw extruder and injection molded after were characterized by mechanically and scanning electron microscopy. The results from the flexural and tensile strength demonstrate that the addition of 20 wt % cotton fibers tends to increase in these properties; however there is increase when using a coupling agent. The impact resistance increased with the increase of load; however the results of the composites with coupling agent were lower than those without. The micrographs showed a reduction in the pull-out fibers, due to a greater adhesion fiber / matrix with the use of compatibilizer.