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##### **Polypropylene composites reinforced with alumina particles and chopped glass fibers**

Acevedo, N.A.(1); Rocha, M.G.(2); Silva, R.M.C.(1);  
(1) IPRJ; (2) IPRJ/UERJ;

In this work, polypropylene (PP) composites reinforced with alumina ( $\text{Al}_2\text{O}_3$ ) particles and chopped glass fibers (GF) were developed, aiming to improve the thermal and mechanical properties of polypropylene. The effect of each reinforcement element, as well as of the hybrid reinforcement, on the polymer properties was evaluated. The effect of the addition of the coupling agent, polypropylene grafted with maleic anhydride (PP-g-MA) on the properties of the composites, PP/ $\text{Al}_2\text{O}_3$  and PP/GF, respectively, were also investigated. The tensile, flexural and impact properties of the obtained materials were determined. The thermal properties were evaluated through differential scanning calorimetry (DSC), thermogravimetric analysis (TGA) and thermal conductivity measurements. The morphology of the samples was examined by using scanning electron microscopy (SEM). The results obtained showed that the 73/5/20 PP/ $\text{Al}_2\text{O}_3$ /GF composite processed with 2 wt% of PP-g-MA was the material that presented the better combination of mechanical properties. The addition of PP-g-MA to the composites promoted better adhesion between the polypropylene and the reinforcements leading to obtaining better mechanical properties, such as the highest value of impact resistance, Young Modulus, tensile resistance, flexural modulus and resistance. This material presented impact resistance higher than that of polypropylene. The thermal conductivity of polypropylene was not improved with the development of the composites. However, the thermal stability was higher than that of polypropylene. The results obtained shows that this material may be used in engineering applications, where strong and hard PP based materials with good impact properties and satisfactory thermal stability are necessary.