

In this research project, polypropylene blends were prepared from used bags and virgin pellets in the percentages by weight of virgin pellets of 0, 10, 20, 30, 40, 50, 60, 70, 80, 90 and 100 %. Various mechanical properties such as tensile strength, percentage elongation at break, Young's modulus, hardness, impact strength, flexural stress and flexural modulus were determined. It was found that the mechanical properties of the polymer blends improved with the increasing percentage of the virgin pellets. It was also found that the most suitable weight ratio of bags to virgin pellets was 60:40 because at this ratio the mechanical properties were improved while the amount of virgin pellets added was not so high. In addition, the effects of glass fibre reinforcement on mechanical properties were also studied. When the amount of glass fibre in the composites prepared from recycled bags and from the most suitable ratio of bags to virgin pellets (60:40) increased, the mechanical properties tended to improve. However, when the percentage of glass fibre was more than 20 %, agglomeration of the glass fibre occurred so that poor dispersion was observed. The most suitable percentage by weight of glass fibre was considered to be 20 % since it gave the best mechanical properties of composites. Finally, from the determination of the length of the glass fibres in the composites by stereomicroscopy (5x), it was found that the average length was 0.719 mm which is shorter than the critical fibre length (l_c) of 4.81 mm calculated from the equation $l_c = d\sigma_f^{TS}/2\tau_m$. Due to the presence of a coupling agent at the surface of the glass fibre, the adhesion between the glass fibre and the polymer matrix increased resulting in the mechanical properties of the composites increasing as the percentage of glass fibre increased.