UTILIZATION OF RECYCLED HOUSEHOLD WASTE HDPE AND THE EFFECT OF INTRODUCING NEXAMITE R301

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ABSTRACT

During the last decades, plastic has become more widespread in our daily lives. Single use products such as shampoo bottles and food packaging are increasing the plastic pollution. There is ongoing research in the industry on how to recycle household waste. New products were obtained with recycled materials, but improvement is needed to match the virgin material and ensure more widespread production using recycled materials. Additives are being introduced into recycled materials and tested with mechanical and thermal analysis methods.

In this project it was examined how does adding post-consumer recycled High Density Polyethylene (rHDPE) to virgin High Density Polyethylene (vHDPE) influence the properties of the mix. In addition, effects of using rHDPE enhanced with Nexamite R301, when mixing with vHDPE, were studied. Nexamite R301 is a PE based additive used to decrease the melt flow index (MFI) and increase the environmental stress cracking resistance (ESCR) of rHDPE [1].

Blends of HDPE with 0%, 30%, 50% of rHDPE mixed with vHDPE and different amounts of Nexamite R301 additive were compounded over a single run in a twin extruder followed by injection moulding them into dogbones for future testing. Utility of different mixes was determined by mechanical and thermal characterization methods, such as ESCR, rheology, tensile test, differential scanning calorimetry (DSC).

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REFERENCES

[1] https://www.nexamchemical.com/products/reactive-recycling/reactive-recycling-for-pe/