

Behaviour of poly propylene properties of toughness, colour intensity, plastic limit, elastic limit and young's modules under artificial isothermal conditions

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Abstract

Plastic is accumulating in the environment day by day and it is a major threat to environment and human beings. However this problem of accumulation can be mitigated by applying suitable degradation techniques. Recycling and artificial degradation are the best mitigation methods applying for above context. In this study, polypropylene was selected, because of polypropylene, PET, polyethylene are the highly usage in Sri Lanka.

Each standard dumbbell shape polypropylene plastic samples (Thickness 0.3mm) were subjected to artificial isothermal condition at 100, 120, 160 °C. Which was heated at relevant temperature for 4, 8, 12 hours. Standard tensile test was done by using tensile machines. Tensile stress vs. tensile strain graphs were obtained. Colour of the sample was taken by 10 Pixel camera and colour was identified by using picture colour analyser software. Average value of Toughness, Colour intensity, Plastic limit, Elastic limit were reduced respectively 79 %, 92.3 %, 23 %, 63.6% at 100 °C and 79 %, 92.3 %, 23 %, 63.6 % at 120 °C and 79 %, 92.3%, 23%, 63.6% at 160 °C from initial values for 12 hours under 95 % confidence interval. Average Young's modules was increased respectively 180%, 160%, 147.6% from initial values at 100°C, 120°C and 160°C for 12 hours under 95% confidence interval.

Keywords: Young modules, Toughness, Colour intensity, Plastic limit, Elastic limit