Influence of molecular weight distribution on flow properties of commercial polyolefins

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Journal of Applied Polymer Science


Abstract

The aim of this work is to investigate the effects of molecular weight distribution on some conventional flow properties of polyolefins like melt flow index, melt flow ratio, and power law index. The study is designed in two steps. First, the statistical correlation analysis was carried out for proper choice of input variables for each output property and to find the most relevant mathematical forms of the considered parameters for the modeling section. Then the considered property was correlated to the entire molecular weight distribution using spline functions. The best fit was achieved by variation of the number of spline nodes and their values. The proposed methodology is able to be coupled with a polymerization model to correlate the polymerization conditions to the final properties of the product and design a polymerization control loop. © 2008 Wiley Periodicals, Inc. J Appl Polym Sci, 2008