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MULTIPLE LINEAR REGRESSION (MLR) MODELS USED TO PREDICT THE THERMAL STABILITY OF SOME POLYIMIDES

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Abstract

Two multiple linear regression (MLR) models were developed with the aim to estimate the decomposition temperature of a series of polyimides. Two parameters, T_{ni} and T_{ai}, corresponding to the temperature of 10 % weight loss of the sample, determined by dynamic thermogravimetric analysis under conditions of N_2 inert atmosphere and air, respectively, were used as a criterion for thermal stability. The obtained MLR models correlate thermostability with a series of characteristics of the studied polymers, such as Van der Waals volume, density, molecular weight, number of aromatic cycles, number of C=O bonds, number of CH_3 groups and the number of CF_3 groups. The results showed that the MLR models can be successfully used to predict the thermal stability of polyimides, the mean percentage errors being below 3%, regardless of the work environment.

Key words: MLR models, polyimides, prediction, thermal stability

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