

عنوان مقاله:

Improving Mechanical Properties of Nanocomposite-based Epoxy by High-impact Polystyrene and Multiwalled Carbon Nanotubes: Optimizing by a Mixture Design Approach

محل انتشار:

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خلاصه مقاله:

In the current study the influence of weight percentage of HIPS, weight percentage of CNT and hardener content on damping 1st and damping 2nd properties of epoxy/HIPS/CNT hybrid composite was evaluated. Mixture design methodology was employed to generate mathematical models for predicting damping 1st and damping 2nd behaviors of new mentioned hybrid nanocomposite as function of physical factors and optimizing desired mechanical properties. The maximum and minimum values of damping 1st occurred in run numbers 7 and 1 and were 3.71% and 1.64 % respectively, moreover maximum and minimum values of damping 2nd occurred in coded levels 9 and 1 with the values of 4.25% and 1.82 % respectively. Results of analysis of variance showed that input variables had linear effect on both of the studied responses, also two component interactions $X_1 \times X_2$, $X_1 \times X_3$ and $X_2 \times X_3$ affected damping 1st and damping 2nd due to their obtained P-values. Optimization results described that the highest value for damping 1st and damping 2nd were 3.53% and 4.11% respectively. Coded values were HIPS= 0.222, CNT= 0.301 and hardener= 0.476 and corresponding mixture components were HIPS=4.18wt%, CNT= 1.12 wt% and hardener= 25.75phr respectively.

کلمات کلیدی:

Carbon fibre, Hybrid, Laminates, Mechanical properties, Mixture Design

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