Optimizing the parameters in durian skin fiber reinforced polypropylene composites by response surface methodology

ABSTRACT

Awareness on the advantages of natural fibers stimulates the interest of researchers to use them as reinforcement in polymer composites for robust application. Therefore, investigation on optimizing the impact property of durian skin fiber (DSF) reinforced polypropylene (PP) composites was carried out to determine the effect of DSF content, fiber size and maleic anhydride polypropylene (MAPP) content. Response surface methodology (RSM) was used in the design of experiments and in the analysis of results. The optimized value for the maximum impact strength of PPóDSF composite was found at 50 wt% DSF content and fiber size range of 250ó500 m with 0 wt% MAPP. The maximum impact property for PPóDSF composite was 10.66 kJ/m2. From the analysis of variance (ANOVA), fiber content significantly affects the strength of PPóDSF composites, followed by the fiber size and MAPP content. The P-value of the model of experiment is less than 0.05 and the determination coefficient (R^2) is nearly 1 which suggested that the model is significant and implies on the precision and processability in the production.

Keyword: Durian skin fiber; Impact property; Optimization; Response surface methodology