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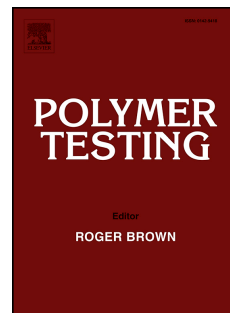
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Material Properties

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ABSTRACT

Oil palm ash (OPA) is available in abundance and is renewable. The effects of a combination of OPA and 3-aminopropyltrimethoxysilane on the properties of styrene butadiene rubber (SBR) compounds based on their mixing ratios were studied using response surface methodology. The cure characteristics and tensile properties were selected as the responses. The significance of these factors and their interactions were analysed using ANOVA. The results showed that the presence of OPA and AMPTES had a significant effect on the properties of SBR compounds, whereby all the responses had R^2 of above 0.9. This indicates that the regression model is accurate in describing and predicting the pattern of significance for each factor studied. In addition, with the highest level of AMPTES (6 phr) and OPA (80 phr) in the SBR, the tensile strength of the mixture was significantly improved by 151.6% compared to that of gum SBR compound. These findings were further supported by scanning electron microscopy.

Keywords: Oil palm ash; 3-Aminopropyltrimethoxysilane; Styrene butadiene rubber; Response surface methodology; Tensile strength

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