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Predicting Porosity Formation in Phenolic Resins for RTM Manufacturing: the Porosity Map

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Abstract

In this work, the formation of porosity generated during curing of a phenolic resin is investigated in the context of RTM. DSC and rheology analyses were conducted on the resin to model the cure kinetics and determine the gel point. Porosity formed in the cured matrix is due to saturation of the solid polymer by water during curing.

Thermogravimetric analysis was carried out to measure the amount of water released during polymerization. Formation of porosity due to curing was studied using an innovative experimental setup that allows visual observation of the resin cure and gelation. It was observed that porosity starts appearing after resin gelation and that degassing the resin at the beginning of curing delays the onset of defects and reduces

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