

MODIFICATION OF CALCIUM CARBONATE SURFACE BY
POLYISOPRENE FOR IMPROVED COMPATIBILITY WITH NATURAL
RUBBER

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ABSTRACT

Calcium carbonate (CaCO_3) is a low-cost inorganic filler commonly used in manufacturing of natural rubber latex products. However, the main problem of CaCO_3 is the incompatibility with and low dispersibility in hydrophobic natural rubber, resulting in a decrease of mechanical properties of CaCO_3 -filled natural rubber products. This problem may be solved by modification of the CaCO_3 surface to reduce its polarity and, hence, to improve its affinity with non-polar rubbers. In this study, the surface of CaCO_3 was modified with polyisoprene using admicellar polymerization. The parameters which influence admicellar polymerization of isoprene on the surface of CaCO_3 were examined. The results of FTIR and TGA testing showed that polyisoprene was successfully formed as an ultra-thin layer on the CaCO_3 surface. The modified CaCO_3 particles also showed increased hydrophobicity. Incorporation of the modified CaCO_3 into natural rubber latex gave dried rubber film with improved mechanical properties. In addition, a lower amount of modified CaCO_3 was required to achieve similar properties compared with the unmodified CaCO_3 .

KEY WORDS: ADMICELLAR POLYMERIZATION / NATURAL RUBBER /
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