

Preparation of cyclopentyl trisilanol silsesquioxanes – modified natural rubber (CpSSQ(OH)₃ - ENR-50) composite hybrid in the presence of HCl acid

Abstract

A composite comprising cyclopentyl trisilanol silsesquioxanes (CpSSQ(OH)₃) and 50% epoxidized natural rubber (ENR-50) was prepared at reflux temperature employed hydrochloric acid (HCl) as catalyst. HCl was found to be an effective catalyst to promote ring opening reaction of ENR-50 and tailored CpSSQ(OH)₃ to the ENR-50 polymer chains via chemical reaction. FTIR spectroscopy reveals a hydroxyl stretching indicating the occurrence of epoxide ring opening reaction. ¹H NMR analysis further proved the incorporation of CpSSQ(OH)₃ into ENR-50 polymer chains via shiftment of proton chemical shift and addition in the proton integrals. Si ²⁹NMR analysis evidence the Si-O-C bond through a chemical shift of silanol group from CpSSQ(OH)₃.

Keywords

ENR-50; Epoxide ring opening; Hybrid; Silsesquioxanes