

Evaluation of Potential of Two Natural Polymers in Enhancing Physical Properties of Silica Filled Natural Rubber Latex Films

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The applicability of two natural proteins; zein and soy, extracted from corn and soya respectively, as surface modifiers for silica to be used in natural rubber latex(NRL) compounds was investigated. Two proteins were extracted by affecting some minor modifications to two established processes. Surface modification of silica with the extracted proteins was affected, in-situ, separately in aqueous media while the preparation of silica dispersions. The modified silica was characterized by FTIR spectroscopy. Physical properties of modified silica incorporated NRL films cast from NRL compounds prepared following a standard formula were measured as per the relevant standards. FTIR spectroscopy confirms the surface modification of silica caused by added proteins. The dispersion stability of modified silica dispersions was observed to be better than that of unmodified silica. Distribution of modified fillers in rubber matrix was found to be better than that of unmodified filler. Both types of modified fillers were found to be capable of enhancing tensile properties of NRL films to different extents with marginal effects on tear properties.