Short Communication

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Hevea Braziliensis Nr Part 2: Potential Commercial Application of Methyl Methacrylated Nr, Heveaplus Mg50 in The Paint and Coating Industries With The Atr Ftir Spectral Analyses of the Final Blend Composite With Acrylate Emulsified Paint

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ABSTRACT

The final composition of the blended Heveaplus MG50 and polyacrylic emulsion paint composition, the depolymerised Heveaplus MG50 latex was mixed with polyacrylic emulsified paint with a minor active pre-dispersed curative agents, other diluent additives and dispersion agents, which was heated up in a steam-batch at 70-80 °C for 25 minute, cool to room-temperature, then the analysis of the final composite material was done using the Bruker ATR FTIR spectroscopy.

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The ATR FTIR spectra are unique in the sense that it could be classified into a set of stereo-specific polymeric structural chains (1) polysioprenoid units, (2) polymethyl methacrylate chain units and (3) the emulsified polyacrylate chain units. These stereo-specific structural configurations are due to the chain breaking, chain branching, crosslinkings between polymeric chains, and oxidative reaction phenomena. In the set of the polyisoprenoid units, the stereo-specific and chemical component units with the frequencies recorded are 2975 cm^{-1} , 1, 2 isomer, νCH_2 ; 3852 3, 4 cm^{-1} , methylene group, 1192, cm^{-1} 3, 4 isoprene isomer, and 566 cm^{-1} 3, 4 isoprene isomer, 526 and 508 cm^{-1} related to C–Cl group from the components of the hydroxy-chlorination process during the depolymerisation of the Heveaplus MG50.

In the polymethyl methacrylate chain, the set of the stereo-specific and chemical components units with the frequencies recorded are 987 cm^{-1} C–O–C stretching vibration MMA, 1272 cm^{-1} C–O–C asymmetric stretching vibration, 1240 cm^{-1} C–O stretching vibration, and 1375 cm^{-1} O–CH group stretching vibration. And finally the polyacrylate stereo-specific and chemical components units with the frequencies recorded are 1728 cm^{-1} CH_2 for the acrylic ester, 1272 cm^{-1} C–O–C asymmetric stretching vibration, 980 cm^{-1} , 1192 cm^{-1} and 1641 cm^{-1} related to the methyl acrylate group.

It is interesting to note that the stereo-specific and structural composition of the final blended depolymerised Heveaplus MG50 and the polyacrylic paint, as reported and indicate that apparently weight %, 449, 93.7, 121.7 and 50.8 are related to the polyisoprenoid, methyl methacrylate (MMA), polyacrylic (emulsified

paint) and the chlorination chemical agent respectively. These proportions of the chemical constituents are reasonable and very close to and in the initial chemical reactant compositions, that MMA portion was in weight 50%, emulsified polyacrylic paint 50%, and the chlorination agent 10%.

The further analysis would explain that some of the methyl methacrylate units are replaced by the acrylate units, thus, the polyacrylate portion tends to increase, that is, 121.7% compared to MMA which is only 93.7% in the initial composition. There are also changes in the polysioprenoid chemical structural backbone where the frequency 1728 cm^{-1} , C=C – assymm stretching, 987 cm^{-1} CH=CHR., 874 cm^{-1} deformation stretching, and 670 cm^{-1} vinyl CH=CHR depleted, and also increased. These changes the final proportion of these four stereo-specific structural configurations, and possibly makes the final blended composition more solubilized. The methyl methacrylate coupled with polyacrylic emulsified (commercial) paint together with the homogeneously dispersed filler makes the final composition the more homogeneously mixable, and brush-able and spread-able. In fact, the final composited blended emulsified MMA–acrylated paint was applied to and painted on the roof-top tiles. They were directly exposed to the environmental conditions – rain and sunlight weathering, and lasted more than 35 months.

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