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Solvation method for study of rubber-filter interaction

The use of salvation method for the identification of the adhesion bonds established across rubber-Kaolin interface was studied. A laminate of flexible rubber film stuck to rigid kaolin represented a model of kaolin filled rubber compound that was peel-tested under action of various permanent loads in the series of alcohols from methanol to butanol. The load providing separation of a lamina under equilibrium conditions was determined and treated as laminate peel strength.

The reduction in peel-strength with increasing dispersive component of the solubility parameter of the destructive medium, to which a lamina was exposed, indicated the presence of the dispersive bonds in the spectrum of adhesion bonds, while decreasing in peel-strength due to increasing of associative component of solubility parameter related to weakening of the polar bonds. Appropriate modification of kaolin with chemicals that improved its reactivity and compatibility with rubber facilitated action of non-polar (dispersion) and polar (orientation and induction) forces upgraded the low cost inactive filler to obtain a creditable performance as reinforcing filler in the rubber formulation technology.