

Thesis Title	Properties of functionalized natural rubber and synthetic rubber blend
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Abstract

This research studied on properties of the blends between natural rubber (STR5L) or functionalized-natural rubber (CNR and HNR) and synthetic rubber such as chloroprene rubber (CR) and acrylonitrile rubber (NBR). The compatibility of the blends of CNR/CR and CNR/NBR or HNR/CR and HNR/NBR was found to be improved more than those of STR5L/CR and STR5L/NBR which glass transition temperature (T_g) of CNR/CR and CNR/NBR or HNR/CR and HNR/NBR showed a single value but STR5L/CR and STR5L/NBR showed two different T_g values. Molecular interaction of the blends was investigated based on the difference of the torque ($\Delta S'$) and it was found that $\Delta S'$ of CNR/CR and CNR/NBR or HNR/CR and HNR/NBR were higher than those of STR5L/CR and STR5L/NBR. This result indicated that CNR/CR and CNR/NBR or HNR/CR and HNR/NBR have stronger molecular interaction than those of STR5L/CR and STR5L/NBR. Moreover, elastic modulus (G') of the blends of CNR/CR and CNR/NBR or HNR/CR and HNR/NBR were higher than those of STR5L/CR and STR5L/NBR. In addition, rheological ability ($\tan \delta$) of CNR/CR and CNR/NBR or HNR/CR and HNR/NBR were found to be less than those of STR5L/CR and STR5L/NBR. This result would confirm that molecular interaction of CNR/CR and CNR/NBR or HNR/CR and HNR/NBR were higher than those of STR5L/CR and STR5L/NBR. G' and $\Delta G'$ of CNR/CR and CNR/NBR or HNR/CR and HNR/NBR composites were found to be higher than those of STR5L/CR or STR5L/NBR composites. This result indicated that the composites of CNR/CR and CNR/NBR or HNR/CR and HNR/NBR showed stronger filler-filler and filler-rubber interaction than those of STR5L/CR or STR5L/NBR composites. This was corresponding to the bound rubber obtained. The higher bound rubber values of CNR/CR and CNR/NBR or HNR/CR

and HNR/NBR composites were obvious. Furthermore, the aging properties including heat, hydraulic oil and toluene aging resistance of rubber products prepared from the blends of functionalized natural rubber and synthetic rubbers blended were found to be better than those with STR5L loading. From these results, it can be summarized that the chemical modification of natural rubber by addition the functional groups is alternative strategy to provide more compatibility with synthetic rubbers and lead to better properties i.e., mechanical properties and aging resistance properties, of the blends compared to nonpolar natural tubber

Keywords : rubber blend / functionalized natural rubber / chloroprene rubber / acrylonitrile rubber / compatibility