

(2) 在相同排胶温度下,偶联剂Si747混炼胶的 $G'_1-G'_2$ 稍大于偶联剂Si69混炼胶,即Payne效应较强;随着排胶温度升高,两种偶联剂混炼胶的 $G'_1-G'_2$ 均呈下降趋势,即Payne效应减弱。

(3) 与偶联剂Si69硫化胶相比,偶联剂Si747硫化胶的交联密度较小。

(4) 偶联剂Si747硫化胶的拉断伸长率和撕裂强度大于、耐磨性能好于偶联剂Si69硫化胶。偶联剂Si69混炼胶适合的排胶温度为145~150℃,偶联剂Si747混炼胶适合的排胶温度为150~155℃。排胶温度适当提高有利于改善偶联剂Si747硫化胶的物理性能。

(5) 偶联剂Si69硫化胶的滚动阻力较小,而偶联剂Si747硫化胶的抗湿滑性能较好。

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## Influence of Silane Coupling Agent on the Properties of Silica/Carbon black Reinforced NR

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**Abstract:** In this study, the influence of silane coupling agents Si747 and Si69, on the properties of silica/carbon black reinforced NR compound was investigated. It was found that comparing with the Si69 modified compound, the curing speed of the compound with Si747 was higher. As the discharging temperature of first mixing stage increased, the difference between the storage modulus at small strain ( $G'_1$ ) and the storage modulus at large strain ( $G'_2$ ),  $G'_1-G'_2$  decreased. The physical properties of the vulcanizates with Si747 were improved with a proper increase of the discharging temperature. It was also found that the rolling resistance of the vulcanizates with Si69 was lower, and the wet skid resistance of the vulcanizates with Si747 was better.

**Key words:** NR; silane coupling agent; silica; carbon black; dynamic mechanical properties

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(朱永康)