

表 5 压缩疲劳温升变化规律吻合。

此外, $\tan\delta$ 峰值可以反映胶料发生玻璃化转变时的链段运动性, 数值越高, 链段运动性越好。图 5 中 $\tan\delta$ 峰值随着硫化温度的升高基本呈降低趋势, 说明无硫化返原或顺反异构化现象的硫化温度为 150 °C 的 SIBR 硫化胶链段运动性较好。

3 结论

(1) 与 IR, SBR 和 BR 相比, 未补强 SIBR 胶料焦烧时间较长, 硫化速率较慢; 炭黑补强 SIBR 胶料焦烧时间明显缩短, 硫化速率增大, 硫化平坦性较好。

(2) SIBR 在硫化温度超过 170 °C 时存在明显的硫化返原现象, 并导致相应硫化胶的压缩疲劳温升和动态损耗增大, 其适宜硫化温度为 150 °C。

参考文献:

[1] Marl N K H. The Integral Rubber Concept: An Approach to

an Ideal Tire Tread Rubber[J]. Kautschuk und Gummi Kunststoffe, 1985, 38(3): 178-185.

[2] 吴清洁, 赵建青, 贾德民. 高性能轮胎胎面胶的研究进展[J]. 弹性体, 2001, 11(2): 34-38.

[3] 赵光贤. 新一代合成橡胶——集成橡胶 SIBR[J]. 中国橡胶, 2008(10): 34-36.

[4] 于少翼, 张萍, 赵树高. 国产集成橡胶 SIBR 基本性能的研究[J]. 弹性体, 2012, 22(1): 62-66.

[5] 邹华, 赵素合, 张兴英, 等. 星形两嵌段 SIBR 的性能[J]. 合成橡胶工业, 2001, 24(4): 207-210.

[6] Luis González Hernández, Luis Ibarra Rueda. Addition of Chlorine and Nitrogen Dioxide to Linear Polybutadiene. Degree of Isomerization[J]. Die Makromolekulare Chemie, 1974, 175(8): 2317-2328.

[7] Chen C H, Koenig J L, Shelton J R, et al. Characterization of the Reversion Process in Accelerated Sulfur Curing of Natural Rubber[J]. Rubber Chemistry and Technology, 1981, 54(4): 734-750.

[8] 王梦蛟. 聚合物-填料和填料-填料相互作用对填充硫化胶动态力学性能的影响[J]. 轮胎工业, 2000, 20(10): 601-605.

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Curing Behavior of Styrene-Isoprene-Butadiene Rubber

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Abstract: The curing behavior of styrene-isoprene-butadiene rubber (SIBR) was studied, and compared with isoprene rubber (IR), styrene-butadiene rubber (SBR) and butadiene rubber (BR). The results showed that, compared with IR, SBR and BR, the unfilled SIBR had longer scorch time and lower curing rate. With carbon black, the scorch time of SIBR decreased obviously, the curing rate increased and the compound had good plateau cure. However, when the curing temperature was higher than 170 °C, there was a remarkable reversion in SIBR, which resulted in vulcanizates having a large temperature increase during dynamic compression process and high dynamic loss. The optimum curing temperature for SIBR was 150 °C.

Key words: styrene-isoprene-butadiene rubber; curing behavior; curing reversion; dynamic loss

一种制备天然橡胶/炭黑混炼胶的湿炼法

中图分类号: TQ332.5 文献标志码: D

由华南理工大学申请的专利(公开号 CN 102816265A, 公开日期 2012-12-12)“一种制备天然橡胶/炭黑混炼胶的湿炼法”, 提供了一种制备天然橡胶(NR)/炭黑混炼胶的湿炼法, 即采用天然胶乳与炭黑分散体通过液-液共凝聚共沉

生成 NR/炭黑共沉物。其中炭黑分散体是在搅拌作用下将炭黑分散于净水或炭黑表面处理剂(一元醇、二元醇、醇醚或醚类小分子有机物)水溶液中。采用该方法制得的 NR/炭黑硫化胶具有优良的物理性能, 是制备抗湿滑性能高、滚动阻力低的载重子午线轮胎胎面胶的优质胶料。

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