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## Effect of Silica on Fatigue Resistance of Carbon Black/SBR Composite

HUANG Zhou, YU Xiao-bo, WU You-ping

(Beijing University of Chemical Technology, Beijing 100029, China)

**Abstract:** The effect of silica on the fatigue resistance of carbon black/SBR composite was investigated. The results showed that, compared with carbon black/SBR composite, the  $t_{10}$  of silica/carbon black/SBR compound was extended, the crosslink density decreased, the modulus at 100% and 300% elongation of the vulcanizates decreased, and the elongation at break increased. With silica, the fatigue life of SBR composite was extended at the same strain level. However, the sensitivity of tearing energy on fatigue crack growth rate of the composite changed little. It was found that the silica with smaller the particle size, larger specific surface area and lower structure, was more effective to improve the fatigue resistance of SBR composite.

**Key words:** SBR; carbon black; silica; composite; fatigue resistance

## “轮胎用橡胶发展趋势分析”课题完成验收

中图分类号: TQ336.1; TQ333; TQ332 文献标志码: D

2014 年 11 月 18 日, 由北京橡胶工业研究设计院承担的课题“轮胎用橡胶发展趋势分析”通过了中国石油化工股份有限公司(中石化)科技部的验收。验收专家认为, 该课题首次采用一种新的分析方法, 即以轮胎结构为基础, 分析计算不同规格轮胎的用胶品种和用胶量, 并结合汽车工业及轮胎原配胎和替换胎市场的需求, 推算轮胎用橡胶的实际需求, 对橡胶原材料生产企业的产业规划具有一定的参考价值。

课题组根据我国汽车工业发展现状和轮胎基本情况, 对轮胎用橡胶发展趋势进行了分析。根

据计算, 2018 年中国汽车保有量将达到 2.30 亿辆的规模, 其中乘用车 1.90 亿辆, 商用车 0.41 亿辆。轮胎产量将达到 7.98 亿条, 其中出口 2.82 亿条, 原配胎 1.87 亿条, 替换胎 3.28 亿条。随着聚氨酯轮胎、Tweel、磁悬浮轮胎等特殊功能轮胎新产品的诞生, 欧盟、美国、日本、韩国、巴西等实施的轮胎标签制度, 使传统充气轮胎的发展面临着严峻挑战。我国将在 2015 年年底前完成轮胎湿路面抓着性和滚动噪声限值的制定。因此, 轮胎用胶的研发迫切需要突破原有模式寻求新的路径和方法, 以满足未来的相关法规和汽车市场的多种需求。

(本刊编辑部 冯涛)