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收稿日期: 2015-08-08

Preparation of a Multi-functional Rubber Aids STU and Its Effect on Curing Behavior of Silica/NR Compound

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Abstract: A new multi-functional rubber aids, N-phenyl-N'-(γ -triethoxysilane)-propyl thiourea (STU), was prepared and its effects on the processability and curing behavior of silica/NR compound were investigated. The results showed that, with thiourea and siloxane functional groups, STU could in-situ modify silica surface in hot pressing conditions, effectively inhibit the formation of silica network in rubber matrix, and improve the processability of the compound. As the addition level of silica increased, the scorch time and optimum cure time of STU/silica/NR compound were extended, but the crosslink density was decreased. The optimum addition level of silica was 30 phr.

Key words: multi-functional rubber aids; NR; silica; surface modification; processability; curing behavior

一种高模量沥青混合料添加剂及其制备方法

中图分类号: TE626.8⁺6; TQ333.1 文献标志码: D

由上海市政工程设计研究总院(集团)有限公司申请的专利(公开号 CN 103773006A, 公开日期 2014-05-07)“一种高模量沥青混合料添加剂及其制备方法”, 涉及的高模量沥青混合料添加剂配方为: 改性主剂(废旧聚乙烯、聚丙烯、乙烯-乙酸乙烯酯共聚物的一种或几种的混合物) 100, 丁苯橡胶 10~30、聚乙烯石蜡 15~40, 填料 40~80, 抗老化剂 2~6, 增塑剂 5~20。其制

备方法为: 将改性主剂、丁苯橡胶、聚乙烯石蜡在 160~190 °C 下混合均匀; 再加入填料、抗老化剂和增塑剂等, 在一定转速下搅拌、混合均匀, 经螺杆挤出机挤出, 常温下冷却, 切割成粒。该沥青混合料添加剂主要应用于高等级公路、重交通道路等的新建、改建及养护等路面工程, 可以提高沥青混合料的动稳度、静态模量、动态模量和抗剪切性能, 从而显著减少沥青路面的车辙和推移等问题; 同时可以改善高模量沥青混合料的低温抗裂性能。

(本刊编辑部 赵敏)