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Change in Rubber Cross-linking Network Structure during Tensile Deformation

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Abstract: The change of cross-linking network structure of ESBR vulcanizate during tensile deformation was studied. The results showed that, the crosslink density and type of cross-linking bond were influenced by the addition level of sulfur. The measured incremental modulus of vulcanizate under small deformation was in agreement with the calculated value from crosslink density using statistical mechanics. The total crosslink density of vulcanizate decreased during tensile deformation. The total crosslink density at breaking point was similar with that near the transition point (inflexion point of stress-strain curve), but the number of single and double bonds increased, and the increase was linearly depended on the original amount of polysulfide bond, which indicated some broken polysulfide bond re-structured to form single and double bond.

Key words: ESBR; tensile; crosslink density; type of cross-linking bond

利用废橡胶生产的硫化胶粉与 橡塑材料共混的方法

中图分类号:TQ330.6+3;TQ335+.2 文献标志码:D

由周子凯申请的专利(公开号 CN 101798407A, 公开日期 2010-08-11)“利用废橡胶生产的硫化胶粉与橡塑材料共混的方法”,涉及的方法包括以下工艺步骤:①将粒径 150 μm 以下的废轮胎硫化胶粉投入混合机或捏合机内,加入包括活性分散剂和增容改性剂的复合助剂并搅拌混合均匀,得到活性硫化胶粉;②将活性硫化胶粉作为原料组分之一,与热塑性塑料或热塑性橡胶及其他配合剂进行初混;③初混后的物料可以直接进行熔融成型加工,也可通过熔融共混,用挤出机先制成粒料,再次配料后成型加工,成型方式为挤出成型、注射成型和压延成型。该活性硫化胶粉可明显增大掺用量,显著降低制品原材料成本,有效提高分散均匀性、界面相容性和界面结合力,所得制品的基本性能得到全面改善。

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一种硅烷改性的白炭黑-炭黑复合填料 及其制备方法

中图分类号:TQ330.38 文献标志码:D

由广州吉必盛科技实业有限公司申请的专利(公开号 CN 101798473A, 公开日期 2010-08-11)“一种硅烷改性的白炭黑-炭黑复合填料及其制备方法”,涉及的制备步骤为:①将沉淀法白炭黑和气相法白炭黑按照 3:1~3:2 的质量比加入到高速混合机中,将多硫硅烷以喷雾的形式缓慢均匀加入,逐步升温 100~120 $^{\circ}\text{C}$ 促使表面改性反应进行彻底;②在继续搅拌和保温的情况下,按照炭黑与气相法白炭黑和沉淀法白炭黑的质量比为 1:5~1:10 加入炭黑并混合 60~180 min,降温冷却,即得硅烷改性的白炭黑-炭黑复合填料。该复合填料改善了气相法白炭黑在橡胶中的分散性,减少了生产现场加料次数,明显改善了操作环境,用于轮胎胎面胶配方中可明显降低轮胎滚动阻力,减少燃油消耗。

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