

Effect of Antioxidants on Properties of Hydrogenated Nitrile Rubber in Peroxide Curing System

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Abstract: The effect of antioxidants on the properties of hydrogenated nitrile rubber (HNBR) compounds with the peroxide curing system was studied. The results showed that antioxidants could significantly affect the crosslink density of HNBR vulcanizates. Antioxidant ZMTI consumed more free radicals generated by peroxide and thereby hindered the peroxide vulcanization reaction to a greater extent during vulcanization, therefore the crosslink density of the vulcanizate with antioxidant ZMTI was the lowest. Antioxidant 445 or ODA exerted relatively less effect on the crosslink density of the vulcanizate. Compared with other antioxidants, the hardness and modulus of HNBR vulcanizate with antioxidant 445 were the largest, the elasticity was the best, and the compression set and loss factor were the smallest. Overall, the antioxidant 445 was a suitable antioxidant for the HNBR compound with peroxide curing system.

Key words: antioxidant; HNBR; peroxide curing system; crosslink density; tensile property; aging resistance; dynamic mechanical property

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日前,国家知识产权局发布第二十三届中国专利奖授奖决定,评选出中国专利金奖30项、银奖60项、优秀奖791项以及中国外观设计金奖10项、银奖15项、优秀奖52项。

专利“五复合橡胶挤出机头”荣获中国专利金奖,专利号为ZL201310129264.2,专利权人为桂林橡胶设计院有限公司,发明人为黄发国、江建平、邓文忠等。本发明的五复合橡胶挤出机头包括安装于模座上的上模、上中模一、上中模二、中模、下中模、下模,模座上开有连接挤出机机筒按骑背式结构布置的5个挤料口,倾斜设置的各挤料口连通合模后的各模体之间分型面流道腔。上模挤料口、上中模挤料口、中模挤料口、下中模挤料口、下模挤料口的轴线与水平面的较佳夹角方案分别为 $34^{\circ}\sim 38^{\circ}$, $16^{\circ}\sim 20^{\circ}$, $2^{\circ}\sim -2^{\circ}$, $-13^{\circ}\sim -17^{\circ}$, $-33^{\circ}\sim -37^{\circ}$ 。发明中还给出了相配合的各模体间的分型面与水平面的夹角和各模体间的分型面流道腔的长度,保证所联接挤出机的合理位置,优化布局,便于安装与维护。

专利“白炭黑/聚(衣康酸酯-异戊二烯-甲基丙烯酸缩水甘油酯)生物基弹性体复合材料的制备方法”荣获中国专利优秀奖,专利号为ZL201510908543.8,专利权人为北京化工大学,发明人为张立群、乔荷、王润国等。聚(衣康酸酯-异戊二烯-甲基丙烯酸缩水甘油酯)与白炭黑皆来源于非石油基原料,不依赖石化资源。引入了甲基丙烯酸缩水甘油酯的复合材料与没有引入甲基丙烯酸缩水甘油酯的复合材料相比,白炭黑的分散性改善,橡胶制品的力学性能和抗湿滑性能提高,滚动阻力降低,避免了硅烷偶联剂的使用,从而简化了加工工艺,是一种很有应用前景的生物基“绿色轮胎”橡胶材料。

专利“一种羟基清除剂、其制备方法及其含有它的硫化硅橡胶”荣获中国专利优秀奖,专利号为ZL201210444659.7,专利权人为广州回天新材料有限公司,发明人为徐珊、乐小飞、赵勇刚。本发明的新型羟基清除剂既能捕获脱醇型室温硫化硅橡胶中产生的游离醇,又能加快脱醇型室温硫化硅橡胶的深层固化速度。

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