Elastomer[J].Plastics,Rubber and Composites,2005,34(8):372-377.
[5] Diani J, Fayolle B, Gilormini P. A Review on the Mullins Effect[J]. European Polymer Journal,2009,45(3):601-612.
[6] Wei D Y, Hua J, Wang Z B. Dynamically Vulcanized Acrylonitrile-Butadiene-Styrene Terpolymer/Nitrile Butadiene Rubber Blends Compatibilized by Chlorinated Polyethylene[J]. Journal of Applied Polymer Science,2014,131(21):8558-8572.
[7] Mullins L, Tobin N R. Theoretical Model for the Elastic Behavior of Filler-Reinforced Vulcanized Rubbers[J]. Rubber Chemistry and Technology,1957,30(2):555-571.
[8] Rault J,Marchal J,Judeinstein P,et al. Stress-Induced Crystallization and Reinforcement in Filled Natural Rubbers: 2H NMR Study[J]. Macromolecules,2006,39(24):8356-8368.
[9] Wang Z B, Zhao H L, Zhao J, et al. Rheological, Mechanical and Morphological Properties of Thermoplastic Vulcanizates Based on High Impact Polystyrene and Styrene-Butadiene Rubber[J]. Journal of Applied Polymer Science,2010,117(5):2523-2529.
[10] Duin M V. Recent Developments for EPDM-Based Thermoplastic Vulcanizates[J]. Macromolecular Symposia,2006,233(1):11-16.

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Compression Mullins Effect and Reversibility of ABS/NBR TPV

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Abstract: The compression Mullins effect and reversibility of thermoplastic vulcanizate (TPV) based on acrylonitrile-butadiene-styrene terpolymer (ABS)/nitrile butadiene rubber (NBR) blends were investigated. It was found that NBR with dimension of 10～15 μm was dispersed evenly in the surface of TPV. The Mullins effect of TPV was clear during uniaxial loading-unloading cycles, the maximum stress, internal friction and loss factor (tanδ) of TPV under the fixed strain level showed the highest values at the first cycle, respectively, and they decreased obviously at the second cycle and continued to decrease, but only slightly, in the following cycles. When the number of the compression cycle increased, the instantaneous residual deformation and stress softening factor (D_s) increased. With the compression strain increasing, the maximum stress, instantaneous residual deformation, internal friction and tanδ of TPV increased obviously, and D_s decreased. The maximum compression stress reversibility of TPV during the second compressionwas improved with the heat treatment temperature increasing, and the best performance was achieved at 110 ℃.

Key words: ABS; NBR; thermoplastic vulcanizate; compression Mullins effect; reversibility

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清华大学汽车工程系危银涛教授带领的轮胎与复合材料课题组在轮胎和橡胶材料疲劳耐久性仿真预测方法的研究方面取得了显著成果，与美国Endurica公司Will Mars博士研发团队合作完成的论文报告《Computing Tire Component Durability via Critical Plane Analysis》经国际轮胎工业协会评选，获2015年度国际轮胎科学与技术大会特别提名奖(Honorable Mention Award)。这是我国学者首次获得该项奖励。国际轮胎科学与技术大会由国际轮胎工业协会组织，自1980年以来每年在著名的“轮胎之都”美国俄亥俄州阿克隆市举办，会议由固特异、米其林、普利司通等国际知名轮胎企业赞助支持，邀请世界众多轮胎企业和研发团队参加，交流和研讨轮胎研发设计与制造的最新技术和理论突破。每次大会设置1个最佳论文成果奖和2个特别提名奖，以表彰在上年度轮胎科学与技术研究领域取得突出成果的团队和个人。

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