

的实际应用具有重要的意义。图6(d)为通过阿雷尼乌斯方程得到的频率- T_g 曲线,通过直线斜率可以得到主转变的 E_a ,同时可推测出不同频率对应的 T_g 。

3 结论

(1) DSC仪和DMA仪均可以快速、方便地测定胶料的 T_g ,测得的 T_g 偏差均较小,说明DMA测定的 T_g 与DSC测得的 T_g 一样具有较高的精度。

(2) 通过DMA仪可以得到DSC不能测试的胶料 E' , E'' 和 $\tan\delta$ 等性能。

(3) DMA仪可以测试胎面胶的 $\tan\delta$ -温度曲线,从而推测胎面胶的抗湿滑性能、生热和滚动阻力。

(4) 根据时间-温度等效原理和WLF方程进行频率外推而得到胶料的频率外推曲线,曲线频率可推至实际测试不可能达到的范围,这对分析橡胶材料的在高频下的实际应用性能具有指导性意义。

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Study on Dynamic Mechanical Properties of Compound by DMA

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Abstract: The dynamic mechanical properties of natural rubber (NR) compounds with different vulcanization degree and tread compound were studied by dynamic mechanical thermal analyzer (DMA), and the results were compared with the testing results from differential scanning calorimetry (DSC) analysis. The results showed that the glass transition temperature (T_g) of the compound could be determined quickly and conveniently by DSC and DMA, and the deviation was small for both methods. DMA could be used to determine the storage modulus (E'), loss modulus (E'') and loss factor ($\tan\delta$). The $\tan\delta$ -temperature curve from DMA test could be used to analyze the wet-skid resistance, heat build-up and rolling resistance of the compound. In addition, based on time-temperature superposition principle and WLF equation, the obtained curve could be extrapolated to a higher frequency range which was difficult to test and it was very useful for the performance analysis of rubber materials under high frequency.

Key words: natural rubber; dynamic mechanical thermal analysis; differential scanning calorimetry; glass transition temperature; frequency extrapolation

国家提高出口退税率的橡胶行业有关产品

中图分类号: TQ330.4 文献标志码: D

经国务院批准,财政部和国家税务总局联合发文(财税[2016]113号),自2016年11月1日起,总计418个产品的出口退税率提高至17%。

提高出口退税率的橡胶行业有关产品清单如表1所示。

表1 提高出口退税率的橡胶行业有关产品清单

产品编码	产品名称
84771090	其他加工橡胶或塑料的注射机
84772090	其他加工橡胶或塑料的挤出机
84775100	用于充气轮胎或内胎模塑或翻新的机器
84778000	其他橡胶或塑料加工机器
84807110	硫化轮胎用囊式型模
84807190	其他塑料或橡胶用注模或压模
84807900	塑料或橡胶用其他型模

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