

Pulverization of Waste Tire Rubber at Ambient Temperature and Its Characterization

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Abstract: A pan mill was introduced to pulverize waste tire tread rubber particles at ambient temperature, and the characteristics of rubber powder and its effect on the mechanical properties of SBR vulcanizate were investigated and compared with those of waste tire tread rubber particle. The results showed that, the size of rubber powder after pulverization process was reduced by one order of magnitude, and the shape was more irregular and the surface roughness was higher compared with original particles. The diameter and its distribution of rubber powder were not strongly affected by relative rotate speed between kinetic mill plane and static mill plane of the pan mill, but greatly affected by clearance between them. Thermal stability of rubber powder was decreased and the crosslink density was reduced by more than half. Compared with tire tread rubber particle, the elongation at break of SBR vulcanizate filled by rubber powder was enhanced evidently, but the Shore A hardness, 100% and 300% modulus and tensile strength were reduced to some extent.

Key words: waste tire; pulverization at ambient temperature; pan mill; rubber powder

2011 THERMAX® 热裂解法炭黑橡胶应用技术研讨会在上海举行

中图分类号: TQ330.38⁺1 文献标志码: D

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