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The effect of silane type on mechanical properties and fogging phenomenon of lamp socket rubber

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Bis-(3-triethoxysilylpropyl) tetrasulphide (TESPT) and 3-mercaptopropyltrimethoxysilane (MTMO) are used as silane coupling agent for silica fume. The modified silica fume is used as reinforcing filler in ethylene propylene diene monomer (EPDM) for lamp socket rubber. The cure characteristics, rubber mechanical properties and fogging phenomenon of lamp socket rubber are investigated. Test results show that the maximum torque (M_H) and differential torque (M_H-M_L) increase but the minimum torque (M_L) and cure time at 10% and 90% decrease with the increasing of silane coupling agent loading. The comparison rubber mechanical properties of modified silica fume by TESPT and MTMO are also discussed. The TESPT shows the enhancement in rubber mechanical properties such as hardness, tensile strength and 300% modulus more than MTMO. For the fogging test of lamp socket rubber by gravimetric method which is used for control rubber products quality in automotive industry. The using of modified silica fume by TESPT show the better result than MTMO due to less mass of condensable constituent.

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