

4172300323 : MAJOR CHEMICAL TECHNOLOGY

KEY WORD : NATURAL RUBBER / POLYBUTADIENE / SILICA / RUBBER BLEND

TIVAWAN VIYA : THESIS TITLE. MECHANICAL PROPERTIES OF SILICA-FILLED

NATURAL RUBBER/POLYBUTADIENE RUBBER BLEND. THESIS ADVISOR :

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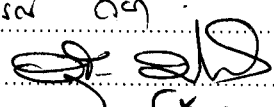
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Rubber blends with different natural rubber and polybutadiene ratio (100:0, 80:20, 70:30, 60:40 and 0:100) was prepared by melt-mixing process. The effect of silica as reinforcement on the blend properties was investigated. The mixing characteristics of the rubber reinforced with silica content (30, 40 and 50 phr) were analyzed from the rheographs. Silica affected to the physical properties of both unvulcanized and vulcanized compounds, Mooney viscosity and Mooney scorch increased, rate of cure and time of cure 90 % decreased. Addition of silica is advantage to the vulcanizing process (compression moulding), since it causes the reduction of time and energy. Mechanical properties of silica-filled natural rubber/polybutadiene rubber blend were investigated. The effects of blend ratio and silica content on the mechanical properties were studied. Tensile strength, % elongation at break, modulus, tear strength of unageing and ageing rubber compound show considerable improvement by the addition of the silica. Flex cracking resistance, compression set and resilience decreased with increasing silica content. It is found that the rubber blends with silica have superior mechanical properties with good abrasion resistance. Dynamic mechanical thermal properties of rubber blend was studied, storage modulus, loss modulus and Tan delta decreased with increasing silica content. The blend of natural rubber and polybutadiene at ratio of (NR : BR) 70 : 30 with silica filled at 40-50 phr exhibits the good physical and mechanical properties.

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