Pengaruh modifikasi carbon black pada perubahan sifat vulkanisat karet alam jenis thin pale crepe (TPC) = Effect of carbon black modification in properties changes vulcanized natural rubber type thin pale crepe (TPC)

Mahendra Anggaravidya, author

Abstrak

Ukuran partikel/agregat carbon black, dapat memberikan pengaruh terhadap sifatsifat vulkanisat karet alam jenis Thin Pale Crepe (TPC). Vulkanisat yang ditambahkan carbon black yang dimodifikasi dengan proses sonofikasi dan 3- aminopropyltriethoxysilane (APTS), dikarakterisasi mengunakan Surface Area Analyzer, Fourier Transform Infrared Spectroscopy (FTIR), Scanning Electron Microscopes - Energy Dispersive Spectrometry (SEM-EDS), Thermo Gravimetric Analysis (TGA), Universal Testing Machine, Abrasion Tester, dan Hardness Tester. Hasil penelitian menunjukan penambahan carbon black dan APTS, memberikan pengaruh terhadap nilai bound rubber, ketahanan panas, tensile strength, tear strength, elongation at break, modulus 100%, modulus 300%, hardness, abrasi dan compresion set dari vulkanisat yang dihasilkan. Vulkanisat yang ditambahkan dengan carbon black hasil sonofikasi dan vulkanisat yang ditambahkan APTS mengalami peningkatan sifat mekanik dan ketahanan panas, memiliki ketahanan terhadap proses penuaan (aging) serta meningkatkan ketahanan terhadap paparan ozon (ozone resistance). Akan tetapi apabila penambahan carbon black hasil sonofikasi dan APTS dilakukan secara bersamaan, akan menyebabkan terjadinya penurunan sifat vulkanisat yang dihasilkan.

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Size of carbon black particle/aggregate, can give effect to the properties of vulcanized natural rubber type Thin Pale Crepe (TPC). Vulcanized added carbon black modified by the sonofication process and 3-aminopropyltriethoxysilane (APTS), were characterized using a Surface Area Analyzer, Fourier Transform Infrared Spectroscopy (FTIR), Scanning Electron Microscopes - Energy Dispersive Spectrometry (SEM - EDS), Thermo Gravimetric Analysis (TGA), Universal Testing Machine, Abrasion Tester, and Hardness Tester. The results showed the addition of carbon black and APTS, giving effect to the value of bound rubber, heat resistance, tensile strength, tear strength, elongation at break, modulus 100%, modulus 300 %, hardness, abrasion and the compression set of vulcanized generated. Vulcanized added with carbon black vulcanized results sonofication and APTS were added to increase the mechanical properties and heat resistance, resistance to aging (aging) and increase resistance to ozone exposure (ozone resistance). However, if the addition of carbon black sonofication and APTS results done simultaneously, it will cause a decrease in the resulting vulcanized properties.