THE EFFECT OF HOMOGENEITY ON TEMPORARY BONDINGS IN SILICONE OIL COATED RUBBER THREAD

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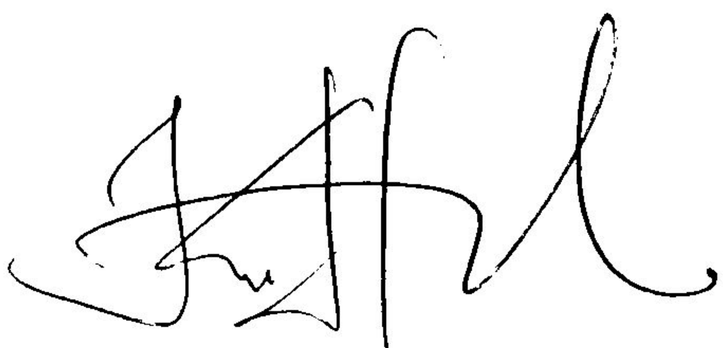

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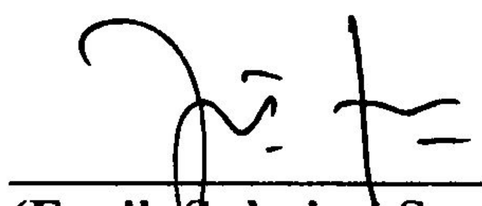

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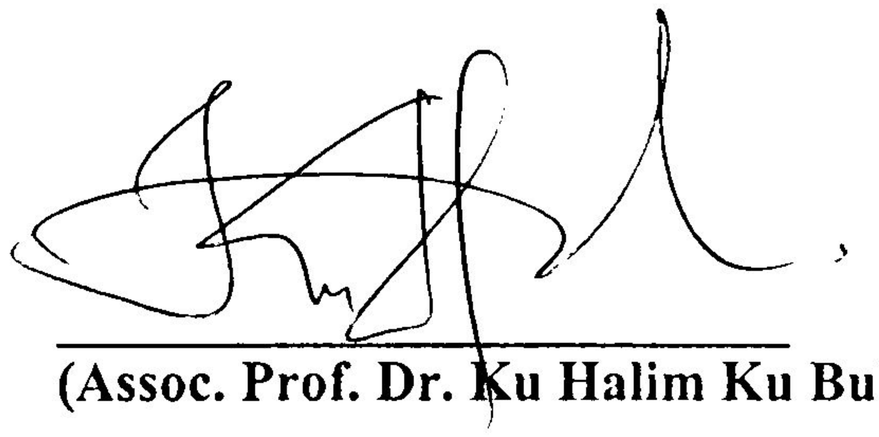

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Despite all these helps, I am sure that, even now, the thesis is not prefect. I am therefore still open to suggestions about how it could be improved. In the meantime, I take full responsibility for all the errors and infelicities that remain.

Cheok Tseng Chuan, October 2001

ABSTRACT

The effect of homogeneity in rubber thread was determined by using a few analytical parameters. Analysis used in the infrared shows the difference between the spectrums of each thread especially in the fingerprint region. Ultraviolet analysis indicated a drastic difference, in which the maximum peaks for each rubber thread varies and can be identified in the inhomogeneous of ingredients in rubber threads. The analysis by using TGA and DSC, were determined that the non-homogeneity of rubber thread is mainly caused by the inorganic materials and is not by rubber molecules and proteins. The scanning electron microscopy (SEM) shows the unevenness of silicon oil coatings on rubber threads, which reduces the easy separation between the threads. Based on the crosslink analysis, the degree of vulcanisation of rubber threads; determined to be well processed. It is detected and identified that the separation problems between each rubber thread is mainly caused by inorganic materials and the silicon oil used, where organic compounds and the degree of curing did not affect the homogeneity and the separation between rubber threads.

ABSTRAK

Kesan kehomogenan dalam bebenang getah telah dianalisiskan dengan menjalankan beberapa parameter kajian ke atas bebenang getah. Mengikut kajian yang dijalankan dengan menggunakan spektroskopi infra merah, didapati wujudnya perbezaan diantara spektrum-spektrum pada bebenang getah yang berlainan terutamanya di kawasan "cap jari". Tambahan pula, dengan menggunakan spektroskopi ultra-lembayung pula, terdapat perbezaan yang ketara dimana puncak-puncak maksima bagi setiap bebenang adalah berbeza. Ini menunjukkan komponen-komponen dalam bebenang getah tersebut adalah tidak seragam. Malahan, daripada analisis yang dijalankan dengan TGA dan DSC, boleh disimpulkan bahawa ketidak homogenan getah berpunca daripada bahan kimia tak organik dan bukannya berpunca daripada molekul-molekul getah dan protein getah itu sendiri. Sementara itu, mikroskop electron (SEM) pula menunjukkan ketidak sempurnaan saduran minyak silikon yang menyebabkan bebenang-bebenang getah tidak mudah dipisahkan diantara satu sama lain. Darjah pemvulkanan getah pula didapati memuaskan berdasarkan analisis kandungan tautsilang. Justeru itu, ketidakhomogenan dalam bebenang getah yang menyebabkan kesan pengasingan antara bebenang-bebenang getah bukannya daripada bahan organik dan darjah pemvulkanan tetapi adalah daripada bahan kimia tak organik dan minyak silikon yang digunakan.