

[Quantitative Analysis of Stearic Acid in Vulcanized Styrene-butadiene Rubber by Thermally Assisted Hydrolysis and Methylation Using GC/MS](#)

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Abstract:

The concentration of stearic acid in vulcanized rubbers affects the physical properties of the rubber. Properties such as hardness, tensile strength, and compression set are directly related to the stearic acid content. There exists a need for a quantitative analytical method for the determination of stearic acid in rubber. This report illustrates two methods which can be used for the measurement of stearic acid in styrene butadiene rubber (SBR): thermal desorption (TD)-GC/MS and reactive thermal desorption (or thermally assisted hydrolysis and methylation (THM))-GC/MS. TD-GC/MS analysis is a simple procedure for the determination of the fatty acids in SBR but the quantitative results are not necessarily satisfactory, as measured by relative standard deviation (RSD) for the determined values. This is attributed to the carboxylic acid group which may interact with the stationary phase coated on the separation column. This assumption is rationalized by the appearance of the asymmetric peak of the free fatty acid. On the other hand, THM-GC/MS analysis is a simple analytical method and the experimentally obtained concentration of the methyl ester agrees well with the known concentration. Precision is less than 3.2 % in RSD.

* Excerpted from online journal website (Click the title)

Frontier Labs products used:

Multi-Shot Pyrolyzer