An Industrial Push for Hydrogen Carrier Gas in Gas Chromatography: A FAME Application of AOAC Method 996.06

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1. Introduction

Carrier Gases

The limited supply and production of helium sales has caused the price to increase exponentially (Figure 1). Suppliers have been forced to severely limit the sale of helium and they are starting to sell exclusively to parties that have no alternative to using helium. Gas chromatography has other options for carrier gas but the main vendors of these carrier gases have no equipment available to support the generation of hydrogen. Currently, customers may not have adequate supply of helium as the suppliers do not view their need to be expanded.

Industry has had to adapt to the helium shortage by using an alternative carrier gas for their GC methods. The United States Food and Drug Administration (FDA) requires the manufacturers of food products to include a profile of fats on the nutrition label. The fatty acid analysis by GC, the AOAC 996.06 method contains a sample preparation section that creates the fatty acids to Fatty Acid Methy Esters (FAME). The equation in Figure 5 shows the conversion.

\[ \text{Fatty Acid} + \text{MeOH} \rightarrow \text{Fatty Acid Methy Ester} \]

2. Experimental

Fatty Acid Methy Ester Standards

Various fatty acid standards are of particular interest given that they have a higher melting point and have the potential to clog arteries. It can be financially beneficial to switch to hydrogen carrier gas whether using tank or generator.

3. Results and Discussion

4. Conclusions