Automating Complex Standards and Sample Preparations Using the Agilent 7696A WorkBench

In analytical chemistry, sample preparation can be a simple dilution or a multi-step derivatization to improve the instrumental measurements. While sample preparation is a critical component to any chemical measurement, chemists rarely look forward to performing this job, especially if it is complex, boring and involves handling toxic chemicals. A good example of a difficult manual preparation is ASTM method D6584; which is used to measure glycerins in B100 biodiesel.[1] The method requires derivatization of the non-volatile glycerins prior to GC analysis. This sample preparation is complex, time consuming, and uses pyridine; a toxic solvent with a very unpleasant odor.

Key Benefits

- Obtain the same results as manual preparation regardless of experience

- Fewer consumables

- Use less of your expensive reagents

- Less exposure to toxic chemicals

- More time for key tasks (that is, method development, data review)

The Agilent 7696A WorkBench is a standalone instrument specifically designed to automate sample preparation.[2,3] Its ability to perform complex sample preparations, like ASTM D6584, is demonstrated using commercially available biodiesels. The analysis results obtained with the WorkBench were identical to those prepared manually (Figure 1). Using the WorkBench, a lab can also get consistent and precise results with less experienced technicians. Figure 2 shows excellent results obtained by four different chemists with no prior biodiesel experience. Full details for this application are contained in Agilent Publication No. 5990-7525EN.

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[1] "D6584 Test Method for Determination of Free and Total Glycerine in B-100 Biodiesel Methyl Esters by Gas Chromatography," ASTM International: 100 Barr Harbor Drive, West Conshohocken, PA, USA, 2010.

[2] Agilent 7696A Sample Prep WorkBench, Agilent Technologies, Publication Number 5990-6908EN, January 28, 2011.

[3] "Improved Data Quality through Automated Sample Preparation," Rebecca Veeneman and Dale Synder, Agilent Technologies, Publication Number 5990-6974EN, December 10, 2010.

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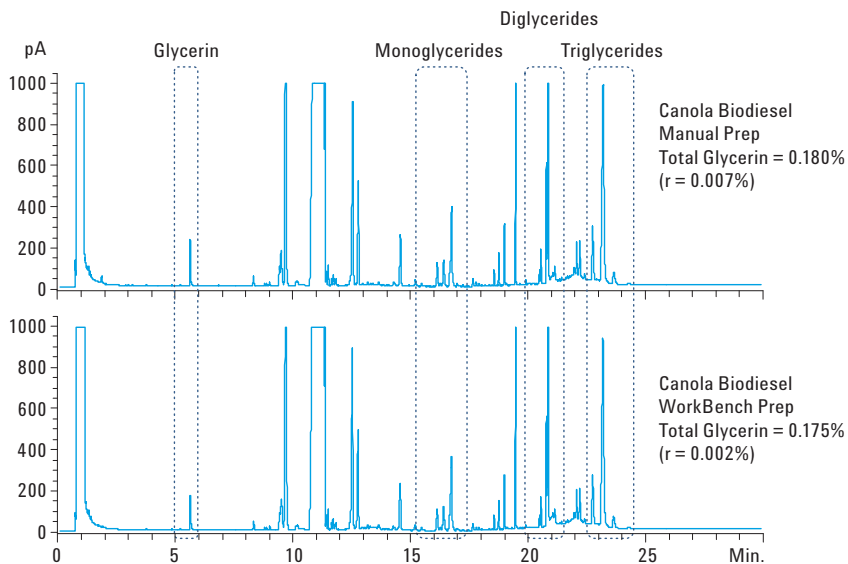
Figure 1. *A WorkBench prepared sample gave the same result, with higher precision, when compared with manual preparation. Each sample was prepared in duplicate to determine repeatability (r).*
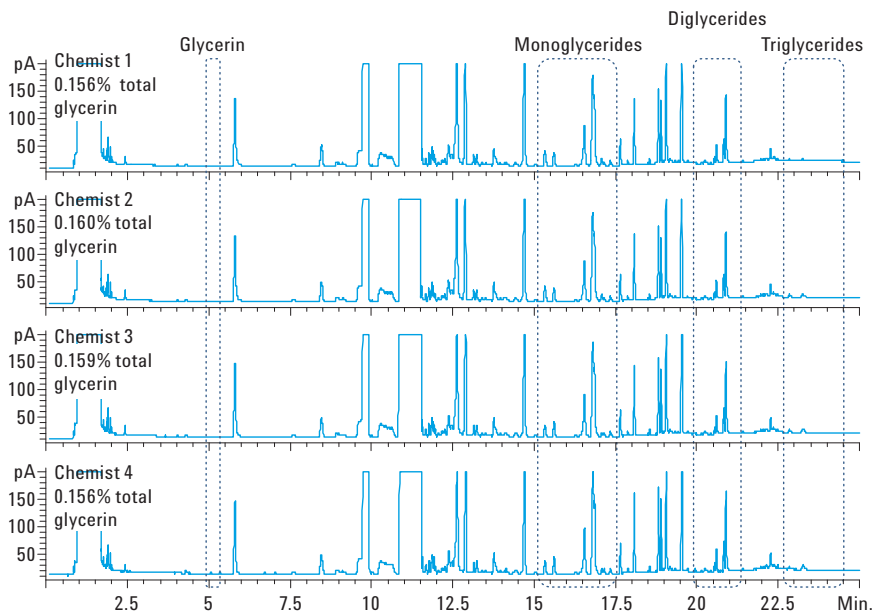
Figure 2. *A comparison of data from a soybean biodiesel sample prepared by four different chemists using the Agilent WorkBench.*

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