Experimental

Results and Discussion

Additionally, the relative response factor (RRF) was calculated for each set of standards. Calculating the RSD of the RRFs provides a measure of linearity and reproducibility. The individual calibration curves (graphed red lines) were compared to the three calibration curves together in the same graph, with the WorkBench standards used as a reference. The average RSD of the RRFs for the three curves made manually was 16.0%, while the three calibration curves made with WorkBench had an average RSD of 3.9%.

Conclusions

The three sample preparation tasks presented here highlighted the increased reproducibility achieved by automating common sample prep tasks with the 7696A Sample Prep WorkBench. Sample dilutions are accurate and reproducible, calibration curve standards are linear with fewer errors, and sample derivatizations can be performed without analyte discrimination.

Additional benefits are also achieved. Smaller amounts of solvents/ reagents are used and the tasks are often completed in less time. Automating the sample prep also frees personnel to perform other tasks. This can result in substantial cost savings in solvent, glassware, standards, solvent disposal and analyst time for laboratories.

While performing other tasks and reduced solvent usage are important, the largest benefit comes from the reduction in error. The automated methods showed better reproducibility and accuracy compared to manual methods, thereby improving the overall quality of the data with less need for rework.

References:


Table 1. After normalizing the fatty acid peak areas to myristic acid, no discrimination was observed among the derivatization methods. The fatty acid ratios for the manual and automated methods are shown in Table 1. Additionally, the relative response factor (RRF) was calculated for each set of standards. Calculating the RSD of the RRFs provides a measure of linearity and reproducibility. The individual calibration curves (graphed red lines) were compared to the three calibration curves together in the same graph, with the WorkBench standards used as a reference. The average RSD of the RRFs for the three curves made manually was 16.0%, while the three calibration curves made with WorkBench had an average RSD of 3.9%.

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