

Using Online SPE to Quickly Develop and Optimize LC/MS Sample Preparation Methods

Traditionally, method development for SPE sample preparation has involved changing a single experimental variable and testing the effect of that change on SPE performance. This approach of testing single variables in isolation is time consuming and often does not result in an optimized or robust method.

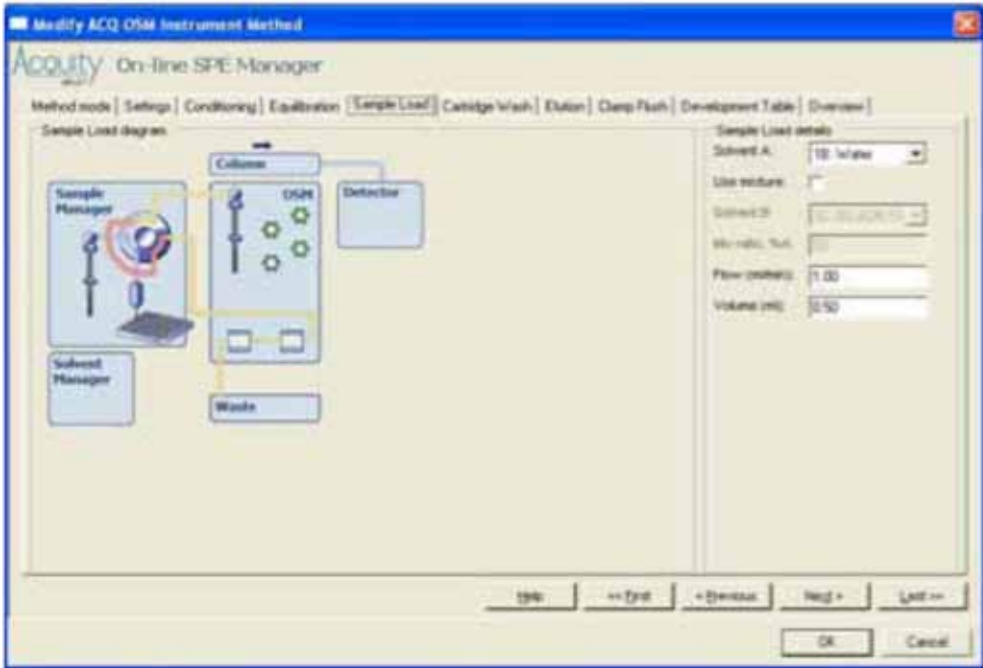
The MassTrak™ Online SPE Analyzer facilitates the use of Design of Experiments (DoE) techniques to significantly improve sample preparation method development and optimization. The MassTrak Online SPE Analyzer can be used to help identify critical experimental variables. Once identified, the system can then simultaneously test a number of those important variables to quickly develop an optimized SPE sample preparation method.

- Identify critical SPE sample preparation method variables
- Understand important interactions between experimental variables in sample preparation
- Quickly develop optimized methods for SPE sample preparation
- Simultaneously test multiple SPE process variables in a single experiment

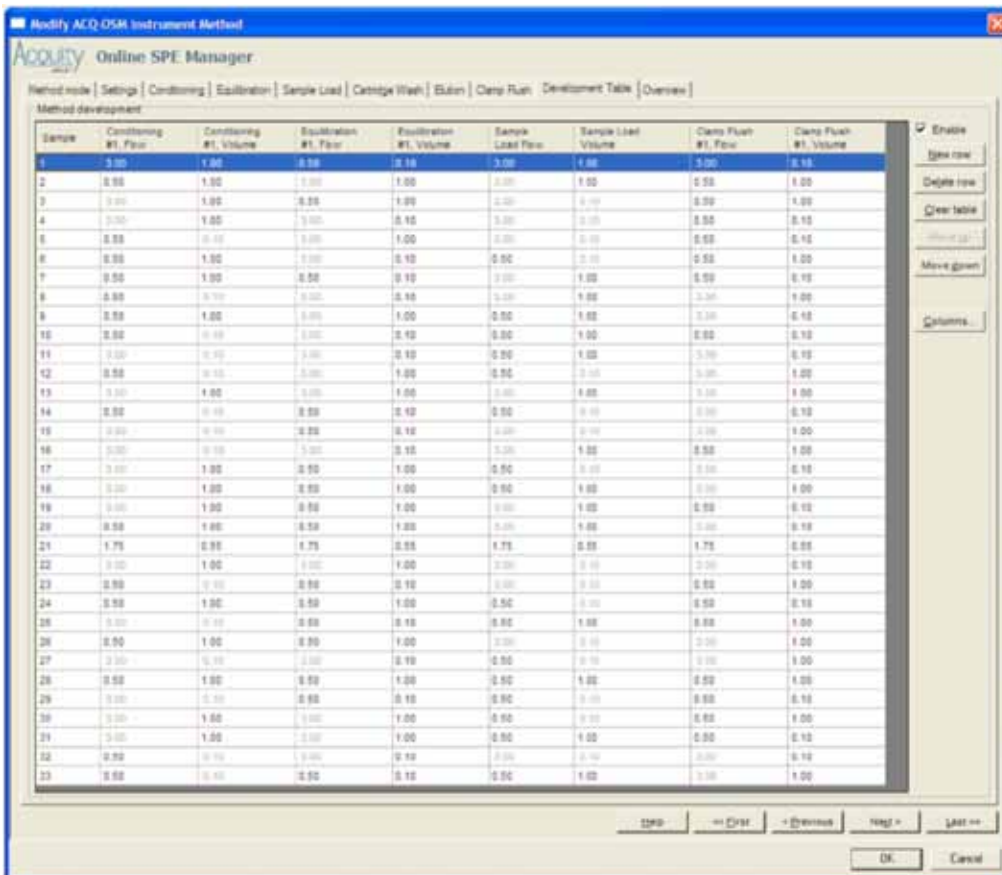


MassTrak Online SPE Analyzer

Configuring the System for Advanced Method Development



Identifying Critical Variables in SPE Sample Preparation





Characterization of SPE Sample Preparation Method Performance

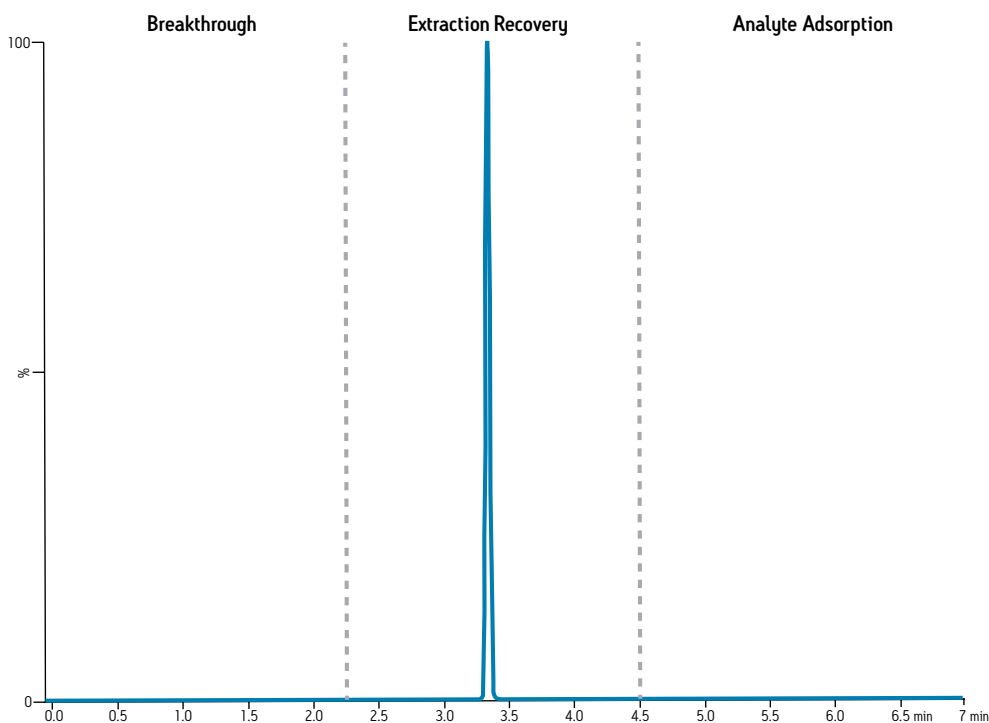


Figure 1: Example chromatogram of using the Advanced Method Development Mode of the MassTrak Online SPE Analyzer to monitor SPE method performance. The first peak to elute is breakthrough, followed by extraction recovery and then analyte absorption.

Impact of Design of Experiments on SPE Sample Preparation Productivity

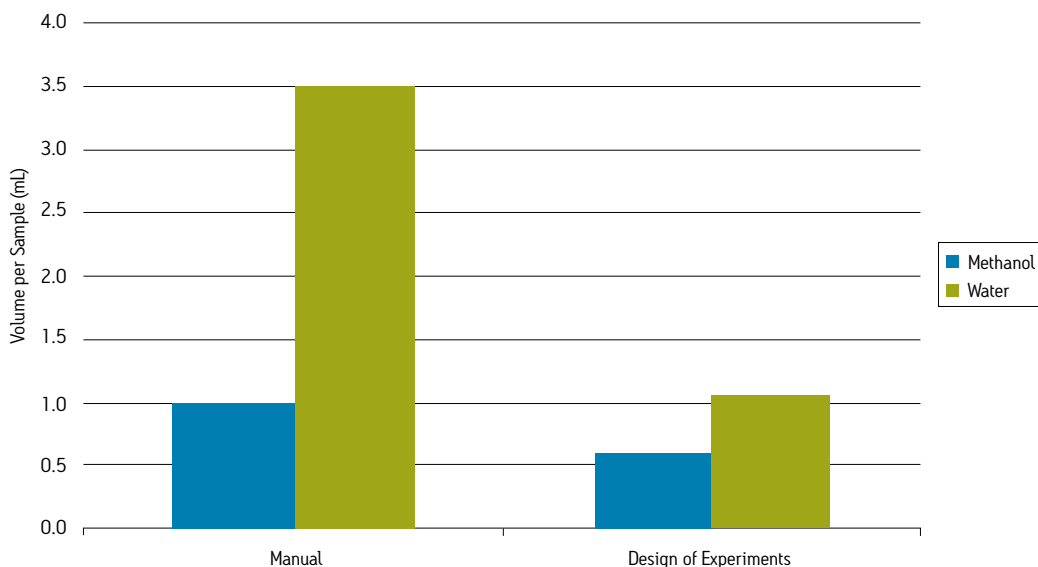


Figure 2: DoE method optimization reduced the amount of solvent used for SPE extraction by around a third. This cuts the cost per sample and can also reduce sample extraction time and increase sample throughput.

Impact of Design of Experiments on LC/MS Assay Sensitivity

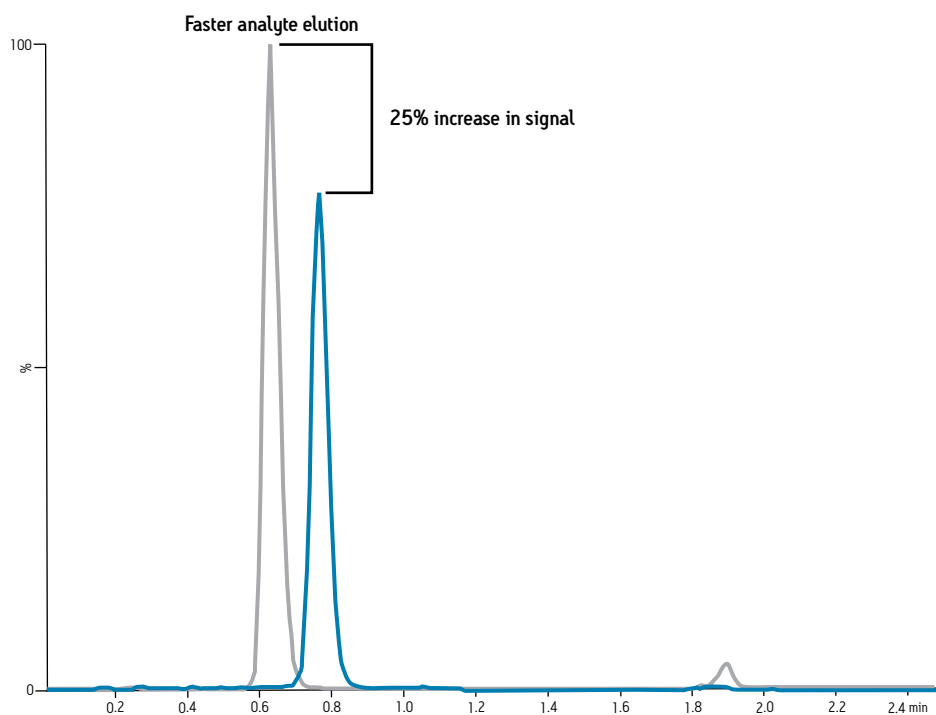


Figure 3: Comparison of signal from the same concentration (100 ng/ml) of a drug analyte measured in plasma using a manually developed sample preparation method (blue) with a signal from a sample preparation method developed using DoE techniques on the MassTrak Online SPE Analyzer (gray). With the DoE developed sample preparation method, assay sensitivity was increased ~25% and the analyte eluted quicker to improve assay throughput!

Use of the MassTrak Online SPE Analyzer and its Design of Experiments capabilities can have significant beneficial effects on SPE sample preparation method development. The system can quickly and efficiently develop SPE sample preparation methods to improve sample throughput and increase assay sensitivity.

ORDERING INFORMATION:

MassTrak Online SPE Analyzer (Part Number 176015065IVD) includes:

- ACQUITY UPLC® Sample Manager (Part Number 186015006IVD)
- ACQUITY UPLC Binary Solvent Manager (Part Number 186015001IVD)
- ACQUITY UPLC Column Manager – A (Part Number 186015043IVD)
- ACQUITY® TQD (Part Number 186003875IVD)
- ACQUITY UPLC Online SPE Manager (Part Number 186015012IVD)

MassTrak Online SPE Cartridges	Part Number
MassTrak C ₁₈ OSM 10 µm, 1x10 mm, 96/pk	186005672IVD

REFERENCE:

¹ Data available in Eastwood et al. Ann Clin Biochem 49:110 Suppl 1. and is also file at Waters.

FOR IN VITRO DIAGNOSTIC USE.

The MassTrak Online SPE Analyzer is not available in all countries. For information more information please contact your local Waters representative.

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