

# Optimizing the Analysis of Semi-volatiles by EPA Method 8270

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## ABSTRACT

The results of this study show how the Thermo Scientific ISQ™ Series Single Quadrupole GC-MS system can meet United States Environmental Protection Agency (U.S. EPA) 8270D Method requirements. Thanks to the extended dynamic range detection system, the method range was 0.2–200ppm using the same column. The new Thermo Scientific™ Instant Connect Helium Saver Module was assessed in this study to show that significant financial costs savings can be realized throughout the lifetime of the GC-MS instrument without compromising the instrument's performance.

## INTRODUCTION

The U.S. EPA released the first Semi-Volatile Organic Compounds (SVOC) method by Gas Chromatography/Mass Spectrometry (Method 8270) at the end of 1980, which is a common method used in almost all environmental labs looking to analyze semi-volatile organic compounds in extracts prepared from many types of solid waste matrices, soils, air sampling media and water.<sup>1</sup> Since then, single quadrupole mass spectrometers have become much more sensitive and the source fragmentation has changed. Many original assumptions<sup>2</sup> about the origin and nature of the species have proven to be wrong or require correction, while the new generations of the mass spectrometers have proven to provide more response in the high-mass region,<sup>3</sup> resulting in adjustment of the tuning criteria to be met.<sup>4</sup> To adjust to these changes, the EPA has changed the ion abundance criteria for the passing of DFTPP in EPA Method 8270D.

## METHODS

### Tuning for DFTPP

The ISQ system was tuned with a built-in EPA 8270D specifically designed tune (DFTPP Tune). This assures fulfillment of all method requirements in terms of ion abundance criteria. A tune verification DFTPP solution was injected to verify that the ISQ system met the tuning requirements shown in Figure 1. The Thermo Scientific™ TraceFinder™ Environmental and Food Safety (EFS) software and Thermo Scientific™ Dionex™ Chromleon Data System (CDS) software, with the Environmental Reporting package, automatically reports tune evaluation performance with Pass/Fail indicator (Table 1).

### Figure 1. Chromatogram and Spectra of Tune Mix.

