

Selected Ion Monitoring (SIM) for Polynuclear Aromatic Hydrocarbons (PAHs)

Background

Many laboratories have inquired about the applicability of 8270 D SIM to detect and report PAHs. Method 8270 D (February 2007) discusses SIM as an option for quantitation limits below the normal range of mass spectrometry. However, "SIM may provide a lesser degree of confidence in the compound identification, since less mass spectral information is available."¹

Scope

The use of 8270 D SIM is applicable to the Department's waste programs. Since SIM is not an option for method 625, **laboratories cannot use SIM when reporting data under the Clean Water Act**. While 8270 D SIM is not considered by DEP to be an alternative or new method that is subject to prior approval according to the DEP QA rule² (62-160 F.A.C.), the critical elements of the method and laboratory certification requirements discussed below must be implemented and documented.

Procedure

1. Follow the optional procedure for SIM in EPA Method 8270D (February 2007), section 11.5.5.
2. In addition, perform the applicable procedures designated for SIM analyses in the EPA Contract Laboratory Program (CLP) document "Analytical Methods for Semivolatiles"³.
3. For both of the procedure references above, follow all other applicable steps of the methods when using the SIM technique.

Quality Control

Perform the following measures for each analyte, using the SIM technique as described in the documents listed under "Procedure" above:

1. Perform a Demonstration of Capability, as required by the NELAC standard⁴ for all analysts involved with the sample preparation and determinative analysis.
2. Perform a method detection limit study according to the DEP QA rule, 62-160.120(16), "Method Detection Limit" (definition and protocol requirements) and the NELAC standard⁴.
3. Establish a practical quantitation limit according to the DEP QA rule, 62-160.120(25), "Practical Quantitation Limit" (definitions) and the NELAC standard⁴.
4. Analyze performance test samples at the designated, experimental low-level concentrations to demonstrate on-going proficiency⁵.

¹ EPA Method SW 846, Method 8270D, February 2007, <http://www.epa.gov/epawaste/hazard/testmethods/sw846/pdfs/8270d.pdf>

² DEP Quality Assurance, 62-160 F.A.C., <http://www.dep.state.fl.us/legal/Rules/general/62-160/62-160.pdf>

³ EPA Contract Laboratory Program, "Analytical Methods for Semivolatiles", SOM01.1 (5/2005), <http://www.epa.gov/superfund/programs/clp/download/som/som11d-svoa.pdf>

⁴ 2003 NELAC Standards, EPA/600/R-04/003, June 5, 2003, United States Environmental Protection Agency, Chapter 5, Quality Systems, Appendix C and D.1.2., <http://www.nelac-institute.org/docs/2003nelacstandard.pdf>

⁵ The NELAC Institute, Non-potable Water Fields of Proficiency Testing, Experimental Analytes, http://www.nelac-institute.org/docs/pt/NPW_EXP_FOPT_2007_01.pdf

5. Perform all applicable calibration and quality control procedures and evaluations according to EPA Method 8270 and the CLP document cited in "Procedure" above.
6. Ensure that the SIM data can be evaluated according to the document "DEP Process for Assessing Data Usability"⁶.

Documentation

1. Keep all laboratory records for the SIM procedure according to the DEP QA rule 62-160.340.
2. Keep records sufficient to ensure that the SIM data can be evaluated according to the document "DEP Process for Assessing Data Usability"⁶.
3. Keep all records for the SIM procedure as required by the NELAC standards⁷.

⁶ DEP, "Process for Assessing Data Usability", DEP-EA-001/07, March 31, 2008, <http://www.dep.state.fl.us/legal/Rules/general/62-160/62-160.pdf>

⁷ 2003 NELAC Standards, EPA/600/R-04/003, June 5, 2003, United States Environmental Protection Agency, Chapter 5, Quality Systems, Section 5.4.12, Control of Records, <http://www.nelac-institute.org/docs/2003nelacstandard.pdf>

References

1. EPA Method SW 846, Method 8270D, February 2007, <http://www.epa.gov/epawaste/hazard/testmethods/sw846/pdfs/8270d.pdf>
2. DEP Quality Assurance, 62-160 F.A.C., <http://www.dep.state.fl.us/legal/Rules/general/62-160/62-160.pdf>
3. EPA Contract Laboratory Program, "Analytical Methods for Semivolatiles", SOM01.1 (5/2005), <http://www.epa.gov/superfund/programs/clp/download/som/som11d-svoa.pdf>
4. 2003 NELAC Standards, EPA/600/R-04/003, June 5, 2003, United States Environmental Protection Agency, Chapter 5, Quality Systems, Appendix C and D.1.2., <http://www.nelac-institute.org/docs/2003nelacstandard.pdf>
5. The NELAC Institute, Non-potable Water Fields of Proficiency Testing, Experimental Analytes, http://www.nelac-institute.org/docs/pt/NPW_EXP_FOPT_2007_01.pdf
6. DEP, "Process for Assessing Data Usability", DEP-EA-001/07, March 31, 2008, <http://www.dep.state.fl.us/legal/Rules/general/62-160/62-160.pdf>
7. 2003 NELAC Standards, EPA/600/R-04/003, June 5, 2003, United States Environmental Protection Agency, Chapter 5, Quality Systems, Section 5.4.12, Control of Records, <http://www.nelac-institute.org/docs/2003nelacstandard.pdf>