

***** Technical Fact Sheet *****
Low Detection Level Analyses of PAHs - GC/MS using SIM

EnviroMatrix Analytical, Inc. (EMA) performs semi-volatile analyses using gas chromatography with a mass spectral detector. Our GC/MS instrument is a state of the art Hewlett Packard 6890/5973 with a Chem-Station and EnviroQuant software. This instrument performs exceedingly well, achieving very low detection limits. With the standard EPA Method 8270, this instrument achieves a reporting limit for the majority of the EPA 8270 compounds of 2 ug/l (ppb) in water.

Using this instrument, we can provide our clients with two options for analyses of polynuclear aromatic hydrocarbons (PAHs). For most projects, EPA 8270 is appropriate. However, for projects requiring lower detection limits we now offer the Selective Ion Monitoring (SIM) method for PAHs. The SIM method is applicable to marine samples such as seawaters, tissues, and sediments. This method is not applicable to samples with expected high levels of contamination.

Using SIM provides an alternative to the HPLC method (EPA 8310) for PAHs. Using the GC/MS provides unequivocal results without the possibility of false positives. Below is a comparison of the Reporting Limit for low level water samples using various methods.

Compound	EPA 8270 (ug/l)	SIM (ug/l)	EPA 8310¹ (ug/l)
Naphthalene	2.0	0.5	1.80
Acenaphthylene	2.0	0.5	2.30
Acenaphthene	2.0	0.5	1.80
Fluorene	2.0	0.5	0.21
Phenanthrene	2.0	0.5	0.64
Anthracene	2.0	0.5	0.66
Fluoranthene	2.0	0.5	0.21
Pyrene	2.0	0.5	0.27
Benzo(a)anthracene	2.0	0.5	0.013
Chrysene	2.0	0.5	0.15
Benzo(b)fluoranthene	2.0	0.5	0.018
Benzo(k)fluoranthene	2.0	0.5	0.017
Benzo(a)pyrene	2.0	0.5	0.023
Dibenzo(a,h)anthracene	2.0	0.5	0.030
Benzo(g,h,i)perylene	2.0	0.5	0.076
Indeno(1,2,3-cd)pyrene	2.0	0.5	0.043

¹ Numbers taken directly from SW-846 method detection limits, individual laboratory reporting limits may vary.

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