

Monitoring EPA-Regulated Chemicals in Ambient Air Below OSHA PELs

(Methylene Chloride, PCE, Carbon Tetrachloride, and TCE)

The US Environmental Protection Agency (EPA) has entered the domain of personal exposure monitoring having performed risk analysis under TSCA Section 6 and has set ambient air exposure limits for certain chemicals that are lower than the workplace limits (PELs) OSHA had set for the same chemicals. Volatile organic compounds (organic vapors) for which EPA ECELS (Existing Chemical Exposure Limits) have been issued or proposed include methylene chloride, perchloro ethylene (PCE), carbon tetra chloride, and trichloroethylene (TCE). EPA also has announced future plans to regulate 1-bromopropane, N-methyl pyrrolidone (NMP), and 1,4-dioxane in a similar manner.

Table 1 – EPA ECEL for Selected VOCs

A component of EPA regulations is the expectation that regular personal monitoring must be conducted to demonstrate compliance with ECELS. This raises the question as to whether personal samplers are available that are capable of measuring personal exposures at the proposed regulatory levels.

Chemical Name	Current		Proposed
	OSHA PEL	ACGIH TLV	EPA ECEL
	(ppm)	(ppm)	(ppm)
Methylene Chloride	25	100	2
Perchloroethylene	100	25	0.14
Carbon Tetrachloride	10	5	0.03
Trichloroethylene	100	10	0.0011

Personal monitoring badges (diffusive samplers) have been well-established as the most cost effective and convenient method for personal monitoring of chemical exposures, and it is well-known that detection (reporting) limits decrease proportionally as sampling time increases. So, the question becomes: "Is there a personal monitoring badge capable of sampling at a rate such that the EPA-proposed ECEL are detectable and measurable?"

525AT Sampler

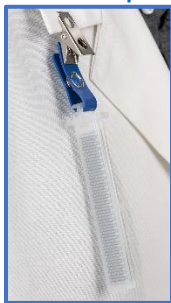


Table 2 (below) lists four volatile organic chemicals EPA plans to regulate along with proposed exposure limits (ECELS). To the right of each exposure limit is shown the AT Labs current reporting (detection) limit for each chemical using gas chromatography. Further to the right is shown the Reporting (detection) Limit for each VOC at various Sampling Times that can be used with the 525AT Sampler. Using this guidance, an environmental health and safety professional can determine an appropriate Sampling Time for his/her organization to sample for each EPA-regulated VOC.

Table 2

Chemical Name	Proposed	Proposed	AT Labs RL (Det'n Limit) (µg)	525AT Samplg Rate (mL/min)	Reporting Limit (ppm) for Sampling Time		
	EPA ECEL	EPA ECEL			8 hr	24 hr	72 hr
	(ppm)	(mg/M3)					
Methylene Chloride	2	6.95	3	72.7	0.025	0.008	0.003
Perchloroethylene	0.14	0.950	2	66.4	0.009	0.003	0.001
Carbon Tetrachloride	0.03	0.189	5	68.9	0.024	0.008	0.003
Trichloroethylene	0.0011	0.006	2	72.9	0.011	0.004	0.001