



Technical Note

SKC 575-001 Passive Sampler Benzene Validation Summary Validation to NIOSH Protocol*

PROCEDURE:	Adsorption on the 575-001 sampler containing 350 mg Lot 120 coconut-base charcoal with desorption (in situ) with 2 ml carbon disulfide and analysis by gas chromatography with flame ionization detection.		
SAMPLING RATE:	16.0 ml/min tested for linearity over the range of 7.5 minutes to 12 hours.		
BIAS AND PRECISION:	The pooled % RSD** for all samplers was 6.2%. Since the uptake of the sampler has been calibrated against standard atmospheres, the method can be considered free from bias. Meets NIOSH accuracy criteria of $\pm 25\%$		
ANALYTICAL RECOVERY:	% Recovery	% RSD	Validation Range (μg) (8-hour TWA ppm)
	93.5	6.2	2 to 50 0.1 to 2
STORAGE:	Samples, which were collected for eight hours at the PEL at 80% (25 C), can be stored for 14 days at ambient (25 C), refrigerator (3 C), or freezer (-8 C) temperatures with no loss in recovery.		
HUMIDITY EFFECTS:	High humidity conditions (80% RH at 25 C) did not affect the uptake rate or recovery.		
REVERSE DIFFUSION:	Not significant ($\leq 10\%$) when samplers were exposed to 2 ppm Benzene for four hours then four hours of clean air at 80% RH (25 C).		
LIMIT OF DETECTION:	Depending on the instrumentation, it is possible to determine at least 2 μg /sampler with a relative standard deviation of less than 10%. This corresponds to an air concentration of 0.57 ppm (v/v) based on an eight-hour sample at the validated sampling rate of 16.0 ml/min.		
FACTOR EFFECTS:	A 16-run six-factor factorial test indicated no statistically significant effects of exposure time, relative humidity, face velocity, orientation, or the presence of 100 ppm ethyl benzene with 200 ppm toluene or any interaction of these factors at the 95% confidence level. A significant effect of concentration is believed to be an artifact of poor analytical precision at low (0.1 ppm) concentrations.		
VALIDATION DATE:	April 1990		

* Sampler passed all criteria of Full Validation to NIOSH Protocol at PEL of 1 ppm.

** Relative Standard Deviation

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SKC Inc. 724-941-9701

SKC South 434-352-7149

SKC Gulf Coast 281-859-8050

SKC West 714-992-2780

www.skcinco.com