
Diffusive sampler for Hydrogen fluoride

Health effects

Hydrogen fluoride is used in the glass etching, electronic, and chemical industries and in the production of aluminium and chlorofluorocarbons (CFCs).

The California Environmental Protection Agency (CalEPA) has calculated a chronic inhalation reference exposure level (REL) of 30 µg per cubic meter for hydrogen fluoride based on effects on bone density in humans. The CalEPA reference exposure level is a concentration at or below which adverse health effects are not likely to occur. It is not a direct estimator of risk but rather a reference point to gauge the potential effects. At lifetime exposures increasingly greater than the reference exposure level, the potential for adverse health effects increases.

Air quality standards

Some air quality guidelines for HF are proposed:

Texas 2000	0.5 µg/m ³	(annual)
TALuft	0.4 µg/m ³	(annual)
WHO 1999	1 µg/m ³	(annual)

Diffusive sampler

The sampler collects HF by molecular diffusion along an inert tube to an absorbent, in this case triethanolamine.

In use, the samplers are mounted with the aid of a clip; the plastic cap is removed at the onset of sampling, thus allowing HF to be transported by molecular diffusion up the tube to the TEA, where it is retained. The cap is replaced at the end of sampling and the collected HF is determined spectrophotometrically by the Alizarin method [1]. Sampling periods for this sampler usually range from 2 to 4 weeks.



Applications

- Indicative measurement of daily means for monitoring air quality standards
- spatial distribution of air pollutants in a wide area to be assessed.
- Assessment of personal exposure for epidemiological studies

Specifications

Sampling rate	20.8 ml/min at 20°C calculated		
Working range	0.5 – 240 µg/m³		
Exposure time	2 to 4 weeks		
Detection limit	0.5 µg/m³ for a 4-week exposure		
External influences:	wind speed	influence of wind speed < 10%	up to 10 m/sec
	temperature	no influence between	10 to 30°C
	humidity	no influence between	20 to 80%
Storage	before use:	12 months	
	after use:	4 months	
Interferences	none		
Extended uncertainty*	22.1 % at concentration level of 100 ug/m³		

*according to GUM; subject to change without notice

revised 20.02.2023

References

- [1] James Lodge: Methods of Air Sampling and Analysis.
Method 203, Part F page 317 und 328 Intersociety
Committee: AWMA, ACS, AIChE APWA ASME AOAC
HPS ISA1989. Third Edition. ISBN 0-87371-141-6

passam ag

Männedorf/Switzerland

passam@passam.ch

SP22_HF_2023