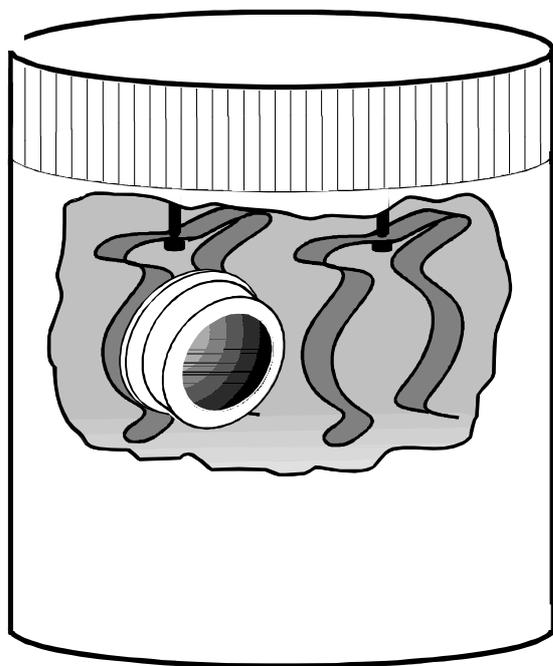


Diffusive Sampler for Sulphur dioxide

Sulphur dioxide is an irritant for the upper respiratory system which may have both chronic and acute adverse health effects. The main source of Sulphur dioxide is use of fossil fuels, especially coal, for heating, and to minor amount of diesel engines.

The passive sampler for sulphur dioxide is based on the principle of the diffusion of sulphur dioxide molecules onto an absorbant medium, in this case a mixture of potassium carbonate and glycerol. The passive samplers are composed of a polypropylene housing with an opening of 20 mm diameter. To reduce wind disturbance a glass fibre membrane is attached, supported by a wire net. To protect the sampler from weather influences, as well as minimising wind disturbance, a specially developed suspension device is recommended.



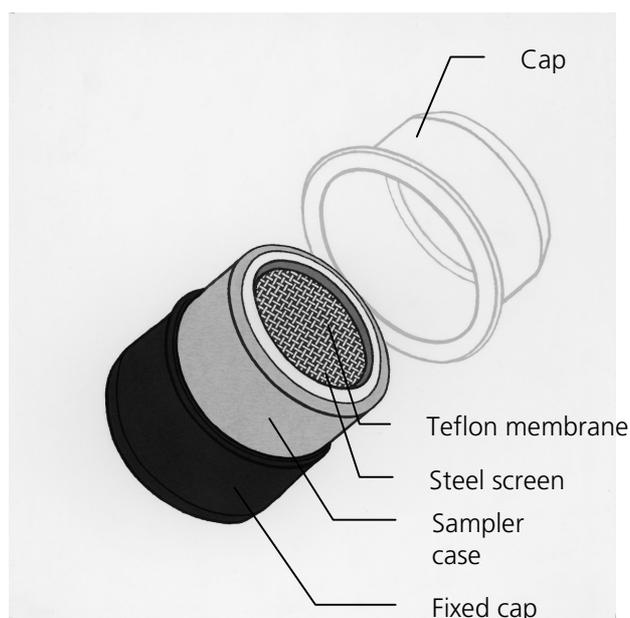
Protective shelter

The amount of absorbed sulphur dioxide is proportional to the environmental concentration. Following an exposure period of 1 week to 1 month the total amount of sulphur dioxide is extracted and ion-chromatographically determined.

Annual limit values or recommendations for sulphur dioxide vary from country to country:

European Union 1999	20 $\mu\text{g}/\text{m}^3$
Switzerland	30 $\mu\text{g}/\text{m}^3$
WHO recommendation	50 $\mu\text{g}/\text{m}^3$
USA	75 $\mu\text{g}/\text{m}^3$

The sulphur dioxide passive sampler is suitable for use as a supplement to continuous measurement stations to better establish the load across an area. When results from the passive sampler lie close to the limit, active methods can be employed to increase confidence in the validity of the measurements.



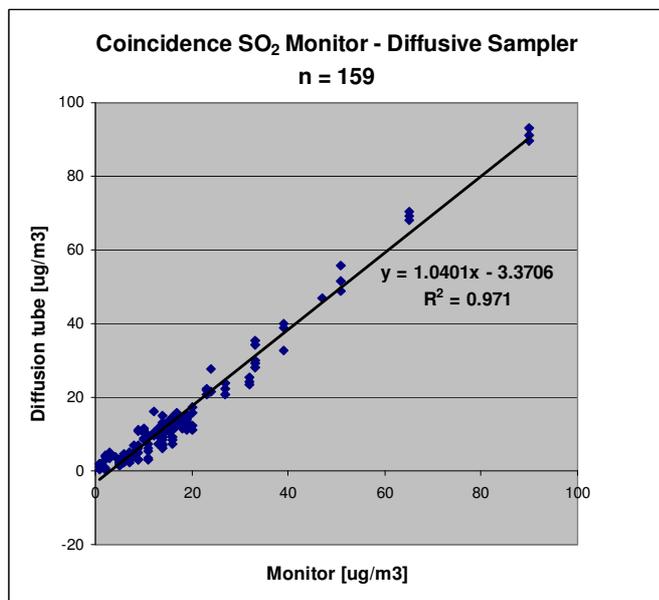
Membrane sampler for sulphur dioxide

Sulphur dioxide is an important precursor for the formation of acid rain. The loading of sensitive ecosystems can be monitored over long periods with passive samplers.



Specifications

The diagram shows the comparison with continuous SO₂ monitors in France [1].



Sampling rate	11.9 ml/min	at 20°C [2]
Working range	1 – 240 µg/m ³	
Sampling time	2 – 4 weeks	
Detection limit	0.2 µg/m ³	for sampling periods of one month
External influences:	wind speed	influence of wind speed < 10% up to 4.5 m/sec using protection shelters
	temperature	no influence between 10 to 30°C
	humidity	no influence between 20 to 80%
Storage	before use:	24 months
	after exposure:	6 months
Cross sensitivity	Specific separation by ion chromatography	
Expanded uncertainty	22.1 % at concentration levels of 40 µg/m ³	

References

[1] AirNormand : Michel Bobbia, Rapport d'études E02_04. Quelques remarques sur la Norme NF ISO 13752 ; 2002
<http://www.airnormand.asso.fr> études divers

[2] Validierungsunterlagen passam ag. Bericht Nr. VP100303 (2003).

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