

Contents

Working Group “Analytical Chemistry” of the Commission of the Deutsche Forschungsgemeinschaft for the Investigation of Health Hazards of Chemical Compounds in the Work Area	XI
Preliminary Remarks	1
1 Introduction	3
2 Theoretical principles of diffusion sampling	3
2.1 Diffusion sampler – permeation sampler	3
2.2 Basic principles of diffusion	4
2.3 Influence of ambient parameters on diffusion sampling	5
2.3.1 Effects of variations in concentration	5
2.3.2 Influence of temperature and ambient pressure	6
2.3.3 Influence of atmospheric humidity	6
2.3.4 Influence of turbulence	6
2.3.5 Influence of exposure time and pollutant concentration	8
2.3.6 Influence of substance-specific properties	8
References	9
Evaluation of Analytical Methods and Results	11
1 Definitions	11
2 Functional quality indexes	12
2.1 Accuracy of an analytical method	12
2.2 Sensitivity of an analytical method	13
2.3 Selectivity and specificity of an analytical method	13
3 Statistical quality indexes	14
3.1 Precision of analytical methods	14
3.2 Obtaining data for statistical analysis	15
3.3 The uncertainty of the standard deviation determined from a small number of measured values	16
3.4 Repeatability and reproducibility of analytical results (ISO 5725)	17
3.5 Detection limit and determination limits of analytical methods	17
3.6 Confidence intervals for mean values	20
3.7 Propagation of standard deviations	21
4 Significance of differences	21
4.1 Examination of analytical results	21
4.2 Examination of standard deviations	21
References	22

Analytical Methods	23
Infrared Spectrophotometric Determination of Gases and Vapours using Long-path Gas Cuvettes	25
Polycyclic aromatic hydrocarbons (PAH)	41
Methanol	53
Hexamethylene diisocyanate (HDI), 2,4- and 2,6-Toluylene diisocyanate (TDI; toluene-2,4- and 2,6-diisocyanate)	67
Tetraethyl orthosilicate	85
4,4'-Methylene-bis(2-chloroaniline)	97
Ethylene glycol derivatives, 2-Methoxyethanol, 2-Ethoxyethanol, 2-Butoxyethanol, 2-Methoxyethyl acetate, 2-Ethoxyethyl acetate	109
Furfuryl alcohol	127
Carbon disulfide	137
N-Methyl-2-pyrrolidone	145
Phenol	155
Dimethylethylamine, Triethylamine	165
Lead	177
Nickel	189
Cobalt	199
Chromium	209
Members and Guests of the Working Subgroup	221