DIN EN 16253:2013-09 (E)

Air quality - Atmospheric measurements near ground with active Differential Optic al Absorption Spectroscopy (DOAS) - Ambient air and diffuse emission measurements

Contents

Page

Foreword 3

Introduction 4

1 Scope 5

2 Terms and definitions 5

3 Symbols and abbreviations 6
3.1 Symbols 6
3.2 Abbreviations 7

4 Principle 7
4.1 General 7
4.2 Configuration of the measurement system 8
4.3 The Beer-Lambert law 9
4.4 Extended Beer-Lambert law 10
4.5 Differential optical density 11

5 Measurement procedure 15
5.1 General 15
5.2 Principle 16

6 Measurement planning 19
6.1 Definition of the measurement task 19
6.2 Selection of measurement parameters of the DOAS system 19

7 Procedure in the field 20
7.1 Installation and start-up of the instrument 20
7.2 Verification of optical properties 21
7.3 Visibility 21

8 Calibration methods 22
8.1 General 22
8.2 Gas cell calibration 22
8.3 Calibration with complete spectral modelling 23

9 Quality assurance 25
9.1 Measurement procedure 25
9.2 Apparent saturation of absorption bands 26

Annex A (informative) Components of the measurement system 27

Annex B (informative) Influence of scattered solar radiation 34

Annex C (informative) Examples of implementations of the DOAS technique 36

Annex D (informative) Performance characteristics 46

Annex E (informative) SI and common symbols and units in spectroscopy 51

Annex F (informative) Application examples 52

Annex G (informative) Example of sample form for a measurement record 80

Bibliography 84