DIN EN ISO 6145-1:2020-02 (E)

Gas analysis - Preparation of calibration gas mixtures using dynamic methods - Part 1: General aspects (ISO 6145-1:2019)

Contents

Page

European Foreword ... **4**

Foreword ... **5**

Introduction ... **6**

1 Scope ... **7**

2 Normative references ... **7**

3 Terms and definitions ... **7**

4 Symbols ... **8**

5 Principle ... **8**
5.1 General ... 8
5.2 Suitability of the method to the application ... 9
5.3 Piston pumps ... 9
5.4 Continuous (syringe) injection ... 10
5.5 Capillary ... 10
5.6 Critical flow orifices ... 10
5.7 Thermal mass flow controller ... 11
5.8 Diffusion ... 11
5.9 Saturation ... 11
5.10 Permeation method ... 12
5.11 Electrochemical generation ... 12
5.12 Summary ... 12

6 Recommendations for handling the dynamic system ... **13**
6.1 Safety considerations ... 13
6.1.1 Reactions between mixture components ... 13
6.1.2 Reactions with dynamic system materials ... 14
6.2 Quality considerations ... 14
6.2.1 Purity of parent gas standards or "zero" gas ... 14
6.2.2 Gas handling ... 14

7 Calibration methods of a dynamic system ... **14**
7.1 Generalities on the calibration ... 14
7.2 Calibration of each element ... 15
7.2.1 General ... 15
7.2.2 Calibration devices for flow rate: Principle and uncertainty ... 16
7.3 Single point calibration of a dynamic system by comparison with reference gas mixtures ... 19
7.4 Calibration certificate ... 19

8 Calculation of the composition and its uncertainty ... **19**
8.1 General ... 19
8.2 Calculations for volumetric methods ... 20
8.2.1 General ... 20
8.2.2 Formulae ... 20
8.3 Calculations for gravimetric methods ... 21
8.3.1 General ... 21
8.3.2 Formula ... 21

9 Sources of uncertainty and uncertainty of the final mixture ... **21**

10 Verification **22**
10.1 Principle 22
10.2 Verification criteria 22
10.3 Recalibration criteria 22
Annex A (normative) **Calculation details** **23**
Annex B (informative) **Atomic weights and molar masses** **27**
Bibliography **29**