

ISO 14912:2025-05 (E)

Gas analysis - Conversion of gas mixture composition data

| Contents | | Page |
|--------------------|---|-------------|
| Foreword | | iv |
| Introduction | | v |
| 1 | Scope | 1 |
| 2 | Normative references | 1 |
| 3 | Terms and definitions | 1 |
| 3.1 | Quantities for the expression of gas mixture composition | 2 |
| 3.2 | Additional quantities involved in conversions of gas mixture composition | 3 |
| 4 | Symbols and units | 4 |
| 5 | Basic Principles | 6 |
| 5.1 | Expression of gas mixture composition | 6 |
| 5.2 | Conversion between different quantities | 7 |
| 5.3 | Conversion between different state conditions | 9 |
| 6 | Main procedures | 9 |
| 6.1 | Conversion between different quantities of composition | 9 |
| 6.1.1 | Conversion of the content of single components | 9 |
| 6.1.2 | Conversion of complete compositions | 10 |
| 6.2 | Conversion to reference conditions | 11 |
| 7 | Practical implementation | 12 |
| 7.1 | Conversion between quantities of composition | 12 |
| 7.2 | Conversion of single contents | 13 |
| 7.3 | Conversion of complete compositions | 13 |
| 7.4 | Conversion between state conditions | 14 |
| 7.5 | Simple approximations applicable to conversion | 14 |
| 7.5.1 | Ideal mixture of ideal gases | 14 |
| 7.5.2 | Ideal mixture of real gases | 14 |
| 7.5.3 | Trace gas mixture | 15 |
| 8 | Input quantities and their uncertainties | 15 |
| 8.1 | Pure gas data | 15 |
| 8.1.1 | Molar mass | 15 |
| 8.1.2 | Compression factor | 15 |
| 8.2 | Gas mixture data | 17 |
| 8.2.1 | Molar mass | 17 |
| 8.2.2 | Compression factor | 18 |
| 8.2.3 | Mixing factor | 20 |
| 8.3 | Rough uncertainty estimates | 21 |
| 9 | Conversion uncertainty | 21 |
| 9.1 | General considerations | 21 |
| 9.2 | Conversion of single contents | 22 |
| 9.3 | Conversion of complete compositions | 23 |
| 9.4 | Variances and covariances of input composition data | 25 |
| 9.4.1 | General procedure | 25 |
| 9.4.2 | Correlation effects in complete composition data | 25 |

| | |
|---|-----------|
| Annex A (informative) Assessment of state conditions | 28 |
| Annex B (informative) Summation relations for the expression of mixture properties | 31 |
| Annex C (informative) Mixture component data | 32 |
| Annex D (informative) Examples | 38 |
| Annex E (informative) Computer implementation of recommended methods | 53 |
| Bibliography | 54 |