DIN EN ISO 21813:2023-01 (E)

Fine ceramics (advanced ceramics, advanced technical ceramics) - Methods for chemical analysis of high purity barium titanate powders (ISO 21813:2019)

Contents

Page

European foreword ... **4**

Foreword ... **5**

1 Scope ... **6**

2 Normative references ... **6**

3 Terms and definitions ... **6**

4 Analytes and ranges ... **6**

5 Preparation of test sample ... **7**
5.1 General ... 7
5.2 Sampling ... 7
5.3 Drying ... 7
5.4 Weighing ... 8

6 Reporting the analytical values ... **8**
6.1 Number of analyses ... 8
6.2 Blank test ... 8
6.3 Evaluation of the analytical values ... 8
6.4 Expression of the analytical values ... 8

7 Determination of the barium and titanium contents ... **8**
7.1 Classification of the determination methods ... 8
7.2 Acid decomposition-gravimetric method ... 9
7.2.1 Principle ... 9
7.2.2 Reagents ... 9
7.2.3 Apparatus ... 9
7.2.4 Procedure ... 10
7.2.5 Blank test ... 10
7.2.6 Calculation ... 10
7.3 Acid decomposition-ICP-OES method ... 11
7.3.1 Principle ... 11
7.3.2 Reagents ... 11
7.3.3 Apparatus ... 11
7.3.4 Procedure ... 11
7.3.5 Blank test ... 12
7.3.6 Drawing of the calibration curve ... 12
7.3.7 Calculation ... 12

8 Determination of the trace element contents ... **12**
8.1 Principle ... 12
8.2 Reagents ... 12
8.3 Apparatus ... 13
8.4 Procedure ... 13
8.5 Blank test ... 14
8.6 Drawing of the calibration curve ... 14
8.7 Calculation ... 14

9 Determination of the total nitrogen content **14**
9.1 Principle 14
9.2 Reagents 15
9.3 Apparatus 15
9.4 Instrument 15
9.5 Procedure 16
9.5.1 Starting up of the instrument 16
9.5.2 Preliminary heating 17
9.5.3 Degassing of the graphite crucible 17
9.5.4 Measuring 17
9.6 Blank test 17
9.7 Calculation of the calibration coefficient 17
9.8 Calculation 18

10 Determination of the oxygen content **18**
10.1 Principle 18
10.2 Reagents 18
10.3 Apparatus 18
10.4 Instrument 18
10.5 Procedure 18
10.6 Blank test 19
10.7 Calculation of the calibration coefficient 19
10.8 Calculation 19

11 Determination of the carbon content **19**
11.1 Classification of the determination methods 19
11.2 Combustion (resistance furnace)-IR absorption spectrometry 20
11.2.1 Principle 20
11.2.2 Reagents 20
11.2.3 Apparatus 20
11.2.4 Instrument 20
11.2.5 Procedure 21
11.2.6 Blank test 22
11.2.7 Calculation of the calibration coefficient 22
11.2.8 Calculation 23
11.3 Combustion (radio frequency heating furnace)-thermal conductometry 23
11.3.1 Principle 23
11.3.2 Reagents 23
11.3.3 Apparatus 23
11.3.4 Instrument 23
11.3.5 Procedure 24
11.3.6 Blank test 25
11.3.7 Calculation of the calibration coefficient 25
11.3.8 Calculation 25
11.4 Combustion (radio frequency heating furnace)-IR absorption spectrometry 25
11.4.1 Principle 25
11.4.2 Reagents 25
11.4.3 Apparatus 25
11.4.4 Instrument 25
11.4.5 Procedure 26
11.4.6 Blank test 27
11.4.7 Calculation of the calibration coefficient 27
11.4.8 Calculation 27

12 Test report **27**

Annex A (informative) **Analytical results obtained from the round-robin test** **28**

Bibliography **30**