ISO 17942:2014-08 (E)

Fine ceramics (advanced ceramics, advanced technical ceramics) - Methods for chemical analysis of boron nitride powders

Contents

Page

Foreword v

Introduction vi

1 Scope 1

2 Normative references 1

3 General rules in chemical analysis 1

4 Analysis items 1

5 Sampling, weighing, and drying of sample 2
5.1 Sampling 2
5.2 Weighing 2
5.3 Drying 2

6 Reporting analytical values 3
6.1 Number of analyses 3
6.2 Blank test 3
6.3 Evaluation of analytical values 3
6.4 Expression of analytical values 3

7 Determination methods of total boron 3
7.1 Classification of determination methods 3
7.2 Fusion-acidimetric titration method 4
7.3 Fusion-ICP-OES 6

8 Determination methods of free boron 8
8.1 Classification of determination methods 8
8.2 Sulfuric acid digestion-ICP-OES and spectrophotometry 9
8.3 Nitric acid digestion-ICP-OES 11
8.4 Methanol extraction-borate separation-ICP-OES and spectrophotometry 12

9 Determination methods of total nitrogen 16
9.1 Classification of determination methods 16
9.2 Acid pressure decomposition-distillation separation-acidimetric titration method 17
9.3 Fusion-ammonia separation-acidimetric titration method 22
9.4 Inert gas fusion-thermal conductivity method 22

10 Determination method of silicon 26
10.1 Determination method 26
10.2 Principle 26
10.3 Reagents 26
10.4 Apparatus and instrument 27
10.5 Amount of sample 27
10.6 Operation 27
10.7 Blank test 27
10.8 Drawing calibration curves 27
10.9 Calculation 28

11 Determination methods of aluminium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, titanium, vanadium, and zinc 28
11.1 Classification of determination methods 28
11.2 Acid pressure decomposition-ICP-OES 28
11.3 Fusion-ICP-OES 31

12 Determination methods of sodium and potassium 34
12.1 Classification of determination methods 34
12.2 Acid pressure decomposition-AAS 35
12.3 Acid pressure decomposition-FES 37
12.4 Acid pressure decomposition-ICP-OES 39

13 Determination methods of carbon 41
13.1 Classification of determination methods 41
13.2 Combustion (resistance furnace)-IR absorption spectrometry 42
13.3 Combustion (RF furnace)-conductometry 45
13.4 Combustion (RF furnace)-IR absorption spectrometry 47
13.5 Combustion (resistance furnace)-coulometry 49
13.6 Combustion (resistance furnace)-gravimetry 49
13.7 Combustion (resistance furnace)-conductometry 49

14 Determination method of Oxygen 49
14.1 Determination method 49
14.2 Inert gas fusion-IR absorption spectrometry 49

15 Test report 52

Annex A (informative) List of commercial certified reference materials 53

Annex B (informative) Analytical results obtained from a round robin test 54

Annex C (informative) Spectral lines for ICP-OES 58

Bibliography 59