ISO/TS 21356-1:2021 (E)

Nanotechnologies — Structural characterization of graphene — Part 1: Graphene from powders and dispersions

Contents

		Foreword			
		Introduction			
1		Scope			
2		Normative references			
3	3		Terms and definitions		
4		Abbreviated terms			
5		Sequence of measurement methods			
6		Rapid test for graphitic material using Raman spectroscopy			
7	7		Preparing a liquid dispersion		
	7.1 7.2 7.2. 7.2.	1 2	General Preparing a dispersion of the correct concentration Powder samples Samples already in a dispersion		
8 9 10		Determination of methods			
		Structural characterization using optical microscopy, SEM, AFM and Raman spectroscopy			
		Structural characterization using TEM			
11		Surface area determination using the BET method			
12		Graphene lateral size and number fraction calculation			
Annex A		(informative) Rapid test for graphitic material using Raman spectroscopy			
	A.1 A.2 A.2. A.2. A.3	1 2	General Sample preparation Sample preparation from a liquid dispersion Sample preparation from powder form Method		
Annex	κB	(inforr	native) Structural characterization protocol using SEM, AFM and Raman spectroscopy		
	 B.1 B.2 B.2. B.3. B.3. B.3. B.4. B.4. 	1 2 1 2 3 1	General Sample preparation Drop casting for SEM, AFM and Raman spectroscopy Optical microscopy SEM analysis General Measurement protocol Data analysis AFM analysis General		
	В.4. В.4	2 3	Measurement protocol Data analysis		

B.5 Raman spectroscopy

- B.5.1 General
- B.5.2 Measurement protocol
- B.5.3 Data analysis

Annex C (informative) Structural characterization using TEM

- C.1 General
- C.2 Sample preparation for TEM
- C.3 Measurement protocol
- C.4 Data analysis

Annex D (informative) Lateral size and number fraction calculation

- D.1 General
- D.2 Average lateral flake size
- D.3 Number fraction
- D.3.1 General
- D.3.2 AFM only
- D.3.3 AFM combined with SEM or TEM
- D.3.4 Raman spectroscopy combined with AFM and SEM or TEM

Annex E (informative) Brunauer–Emmett–Teller method

- E.1 General
- E.2 Sample degassing
- E.3 Method
- E.4 Analysis
- Annex F (informative) Additional sample preparation protocols Silicon dioxide on silicon wafer preparation and cleaning

Page count: 48