ISO/TS 23151:2021-09 (E)

Nanotechnologies - Particle size distribution for cellulose nanocrystals

Contents

Page

Foreword iv

Introduction v

1 Scope 1

2 Normative references 1

3 Termsanddefinitions 1

4 Abbreviated terms 2

5 Dispersion of CNCs 2
5.1 General considerations 2
5.2 Dispersion of CNCs by sonication 3
5.3 Dynamic light scattering assessment of dispersions 4
5.4 Determination of optimal sonication energy 5

6 Sample preparation for microscopy 5
6.1 General considerations 5
6.2 AFM sample preparation 6
6.3 TEM sample preparation 6

7 Atomic force microscopy 6
7.1 General 6
7.2 Instrumentation and accessories 7
7.3 Microscope calibration 7
7.4 Data acquisition 7
7.5 Image analysis 8

8 Transmission electron microscopy 8
8.1 General 8
8.2 Instrumentation and accessories 9
8.3 Microscope calibration 9
8.4 Data acquisition 9
8.5 Image analysis 9

9 Data analysis 10
9.1 General 10
9.2 Assessment of data quality 10
9.3 Fitting distribution models to data 10
9.4 Measurement uncertainty 11

10 Test report 12
10.1 Atomic force microscopy 12
10.1.1 General information 12
10.1.2 Sample 12
10.1.3 Data acquisition 12
10.1.4 Image analysis 13
10.2 Transmission electron microscopy 13
10.2.1 General information 13
10.2.2 Sample 13

10.2.3 Data acquisition 13
10.2.4 Image analysis 14

Annex A (informative) Assessment of CNC dispersions 15

Annex B (informative) Assessment of applied imaging force 16

Annex C (informative) Interlaboratory comparison results: AFM 18

Annex D (informative) Interlaboratory comparison results: TEM 25

Bibliography 34