

ISO/TS 10868:2017-05 (E)

Nanotechnologies - Characterization of single-wall carbon nanotubes using ultraviolet-visible-near infrared (UV-Vis-NIR) absorption spectroscopy

Contents	Page
Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms, definitions and abbreviated terms	1
3.1 Terms and definitions	1
3.2 Abbreviated terms	2
4 Principle	2
4.1 General	2
4.2 UV-Vis-NIR absorption spectroscopy	2
4.3 Optical absorption peaks of SWCNTs in the UV-Vis-NIR region	2
4.4 Relation between SWCNT diameter and optical absorption peaks	4
4.5 Derivation of the purity indicator from optical absorption peak areas	4
4.6 Derivation of ratio of metallic SWCNTs from optical absorption peak areas	6
5 UV-Vis-NIR spectrometer	6
6 Sample preparation method	6
6.1 General	6
6.2 Preparation of D₂O dispersion for measurement of mean diameter and the ratio of metallic SWCNTs	7
6.3 Preparation of solid film dispersion for measurement of the mean diameter and the ratio of metallic SWCNTs	7
6.4 Preparation of DMF dispersion for determination of the purity indicator	8
7 Optical measurement procedures and conditions	8
8 Data analysis and results interpretations	9
8.1 Data analysis for characterization of SWCNT diameter	9
8.2 Data analysis for determination of the purity indicator	9
8.3 Data analysis for characterization of the ratio of metallic SWCNTs	9
9 Measurement uncertainties	9
10 Test report	10
Annex A (informative) Case study for derivation of the relation between optical absorption peaks of SWCNTs and their mean diameter	11
Annex B (informative) Case study for determination of the purity indicator	16
Bibliography	19