DIN EN ISO 22908:2022-11 (E)

Water quality - Radium 226 and Radium 228 - Test method using liquid scintillation counting (ISO 22908:2020)

Contents

Page

European foreword ... **3**

Foreword ... **4**

Introduction ... **5**

1 Scope ... **7**

2 Normative references ... **7**

3 Terms, definitions, symbols and units ... **7**
3.1 Terms and definitions ... 7
3.2 Symbols, definitions and units ... 8

4 Principle ... **9**

5 Reagents and equipment ... **9**
5.1 Reagents ... 9
5.2 Equipment ... 10

6 Sampling ... **11**

7 Instrument set-up and calibration ... **11**
7.1 Optimization of counting conditions ... 11
7.1.1 Preparation of sources ... 11
7.1.2 Optimization process ... 12
7.2 Counting efficiencies of ^{226}Ra and ^{228}Ra ... 12
7.2.1 Preparation of ^{226}Ra and ^{228}Ra standard sources ... 12
7.2.2 Determination of counting efficiencies ... 12
7.3 Blank sample measurement ... 13

8 Procedure ... **13**
8.1 General ... 13
8.2 Separation of radium by precipitation ... 13
8.3 Purification of radium ... 14
8.4 Test sample preparation ... 14
8.5 Measurement ... 15
8.6 Chemical recovery ... 15
8.6.1 General ... 15
8.6.2 Preparation of a QC sample with known ^{226}Ra and ^{228}Ra activities ... 15
8.6.3 Determination of overall counting efficiencies ... 15
8.6.4 Determination of chemical recovery ... 15

9 Quality control ... **16**

10 Expression of results ... **16**
10.1 Calculation of massic activities of ^{226}Ra and ^{228}Ra at the sampling date ... 16
10.2 Standard uncertainty ... 16
10.3 Decision threshold ... 18
10.4 Detection limit ... 18
10.5 Confidence limits ... 18

11 Interference control ... **18**

12 Test report ... **19**

Annex A (informative) **Flow chart of the procedure** ... **20**

Annex B (informative) **Decay series relevant to radium isotopes** **21**
Annex C (informative) **Set-up parameters and procedure** **22**
Annex D (informative) **Validation data** **28**
Bibliography **34**