ISO 23655-1:2022-09 (E)

Water quality - Nickel-59 and nickel-63 - Part 1: Test method using liquid scintillation counting

Contents

Page

Foreword iv

Introduction v

1 Scope 1

2 Normative references 1

3 Termsanddefinitions 1

4 Generalsymbolsandnickel-59andnickel-63specificsymbols 2

5 Principle 4

6 Reagents 4
6.1 Standard solutions 5
6.1.1 Nickel-59 and 63Ni standards 5
6.1.2 Stable nickel standards 5
6.2 Chemical quenching agent 5
6.3 Colour quenching agent 5
6.4 Holdback carrier 5
6.5 Water 5
6.6 Specific reagents for chemical separation 5

7 Equipment 6
7.1 Laboratory equipment for direct evaporation 6
7.2 Liquid scintillation vials 6
7.3 Measurement equipment: Liquid scintillation counter 6

8 Sampling 6

9 Liquid scintillation set up and calibration 7
9.1 Window setting 7
9.2 Background 7
9.3 Calibration 7

10 Procedure 9
10.1 Preliminary 9
10.1.1 Stable nickel content 9
10.1.2 Iron and nickel separation 9
10.2 Liquid scintillation source preparation 9

11 Quality control 10

12 Expression of results 10
12.1 Nickel-59 measurements 10
12.1.1 Nickel recovery 10
12.1.2 Activity calculation 10
12.2 Nickel-63 measurements 11
12.3 Uncertainties and characteristic limits 11
12.3.1 Nickel recovery 11

12.3.2 Nickel-59 measurements 11
12.3.3 Nickel-63 measurements 13
12.4 Limits of the coverage interval 15
12.4.1 Limits of the probabilistically symmetric coverage interval 15
12.4.2 Shortest coverage interval 16

13 Test report 16

Annex A (normative)Isolationandpurificationofnickel 18

Bibliography 20