

ISO 22515:2021 (E)

Water quality — Iron-55 — Test method using liquid scintillation counting

Contents

| | |
|--------|---|
| | Foreword |
| | Introduction |
| 1 | Scope |
| 2 | Normative references |
| 3 | Terms and definitions, symbols, and units |
| 3.1 | General use |
| 3.2 | ⁵⁵ Fe and ⁵⁹ Fe specific terms |
| 4 | Principle |
| 5 | Reagents |
| 5.1 | Standard solutions |
| 5.1.1 | Iron-55 and ⁵⁹ Fe standards |
| 5.1.2 | Stable iron standards |
| 5.1.3 | Chemical Quenching agent |
| 5.1.4 | Colour Quenching agent |
| 5.2 | Holdback carrier |
| 5.3 | Water |
| 5.4 | Specific reagents for chemical separation |
| 5.4.1 | Stable iron carrier solution |
| 5.4.2 | Ammonium hydroxide solution, c(NH ₄ OH) = 4 mol l ⁻¹ |
| 5.4.3 | Nitric acid solution, c(HNO ₃) = 7,2 mol l ⁻¹ |
| 5.4.4 | Ammonium hydroxide solution, c(NH ₄ OH) = 6 mol l ⁻¹ |
| 5.4.5 | Hydrochloric acid, c(HCl) = 9 mol l ⁻¹ |
| 5.4.6 | Hydrochloric acid, c(HCl) = 6 mol l ⁻¹ |
| 5.4.7 | Hydrochloric acid, c(HCl) = 4 mol l ⁻¹ |
| 5.4.8 | Hydrochloric acid, c(HCl) = 0,01 mol l ⁻¹ |
| 5.4.9 | Nitric acid solution, c(HNO ₃) = 8 mol l ⁻¹ |
| 5.4.10 | Nitric acid solution, c(HNO ₃) = 2 mol l ⁻¹ |
| 5.4.11 | Sodium hydrogen phosphate, c(Na ₂ HPO ₄) = 0,5 mol l ⁻¹ |
| 5.4.12 | Hydrochloric acid, c(HCl) = 1 mol l ⁻¹ |
| 6 | Equipment |
| 6.1 | Laboratory equipment for direct evaporation |
| 6.2 | Liquid scintillation vials |
| 6.3 | Measurement equipment: Liquid scintillation counter |
| 7 | Sampling and sample preparation |
| 8 | Liquid scintillation set up and calibration |
| 8.1 | Region setting |
| 8.2 | Background |
| 8.3 | Calibration |
| 9 | Procedure |
| 9.1 | Preliminary |
| 9.1.1 | Stable iron content [11] |
| 9.1.2 | Iron separation |
| 9.2 | Iron-55 source preparation |

- 10 **Quality control**

- 11 **Expression of results**
 - 11.1 **Iron recovery**
 - 11.2 **Detection efficiencies**
 - 11.2.1 **⁵⁵Fe detection efficiency**
 - 11.2.2 **⁵⁹Fe detection efficiency**
 - 11.3 **Iron-55 activity**
 - 11.4 **⁵⁵Fe decision threshold and detection limit**
 - 11.5 **Limits of the coverage intervals**
 - 11.5.1 **Limits of the probabilistically symmetric coverage interval**
 - 11.5.2 **The limits of the shortest coverage interval**

- 12 **Test report**

- Annex A (informative) Isolation and purification of iron**
 - A.1 **Anion exchange [11]**
 - A.2 **Extraction chromatography [13]**

- Annex B (informative) Analysis flow chart**

Page count: 20