

# ISO 18589-4:2019-12 (E)

## Measurement of radioactivity in the environment - Soil - Part 4: Plutonium 238 and plutonium 239 + 240 - Test method using alpha spectrometry

---

<b>Contents</b>		<b>Page</b>
Foreword .....		iv
Introduction .....		v
1	Scope .....	1
2	Normative references .....	1
3	Terms, definitions and symbols .....	1
4	Symbols .....	2
5	Principle .....	2
6	Chemical reagents and equipment .....	2
7	Procedure .....	3
7.1	Plutonium desorption .....	3
7.2	Chemical separation .....	3
7.3	Preparation of the source to be measured .....	3
7.3.1	General .....	3
7.3.2	Electro-deposition method .....	3
7.3.3	Co-precipitation method .....	3
7.4	Background determination .....	3
7.5	Measurement .....	4
8	Expression of results .....	4
8.1	Calculation of the activity per unit of mass .....	4
8.2	Standard uncertainty .....	4
8.3	Decision threshold .....	5
8.4	Detection limit .....	5
8.5	Confidence limits .....	5
9	Test report .....	6
Annex A (informative) Plutonium desorption .....		7
Annex B (informative) Chemical separation of plutonium by an organic solvent .....		11
Annex C (informative) Chemical separation of plutonium on anionic resin .....		13
Annex D (informative) Chemical separation of plutonium by specific resins .....		15
Annex E (informative) Preparation of the source by electro-deposition .....		18
Annex F (informative) Preparation of the source by co-precipitation .....		21
Bibliography .....		23