ISO 9463:2019 (E)

Nuclear energy — Nuclear fuel technology — Determination of plutonium in nitric acid solutions by spectrophotometry

Contents

Foreword

1 Scope

2 Normative references

3 Terms and definitions

4 Principle

5 Chemical conditions

5.1 Stability of Pu(VI)
5.2 Rate of oxidation of Pu(IV) to Pu(VI)
5.3 Destruction of the excess oxidant
5.4 Comparison of Ce(IV) and Ag(II)
5.5 Molar extinction coefficient of Pu(VI)

6 Reagents

6.1 General
6.2 Common reagents for methods using silver oxide or cerium as oxidant
6.3 Reagents for method using silver oxide as oxidant
6.4 Reagents for method using Ce(IV) as oxidant

7 Apparatus

8 Test procedure

8.1 Preparation of the different solutions
8.1.1 Plutonium calibration solution
8.1.1.1 Oxidation by silver oxide
8.1.1.2 Oxidation by Ce(IV)
8.1.2 Sample solutions
8.1.2.1 Oxidation by silver oxide
8.1.2.2 Oxidation by Ce(IV)
8.2 Spectrophotometer setup
8.3 Measurements
8.3.1 Background measurement
8.3.2 Measurements on the calibration solution
8.3.3 Measurements on the sample solution

9 Expression of the result

9.1 Calculation of the concentration of plutonium in the sample
9.2 Reproducibility
9.3 Detection limit

10 Interferences

10.1 Anions
10.2 Cations

Annex A (informative) Preparation of silver (II) oxide (AgO)

A.1 General
A.2 Protocol

Page count: 12