DIN EN ISO 16424:2018-01 (E)

Nuclear energy - E valuation of homogeneity of Gd distribution within gadolinium fuel blends and determination of Gd<(Index)2>O<(Index)3> content in gadolinium fuel pellets by measurements of uranium and gadolinium elements (ISO 16424:2012)

Contents

Page

European foreword ... **3**

Foreword ... **4**

1 Scope ... **5**

2 Normative references ... **5**

3 Principle ... **5**

4 Apparatus ... **6**
4.1 High dispersion direct reading ICP-AES ... 6
4.2 Analytical balance ... 6
4.3 Small stainless steel spoon ... 6

5 Reagents ... **6**

6 Reference solutions ... **6**
6.1 Gadolinium element reference solutions ... 6
6.2 Uranium element reference solutions ... 7

7 Sample preparation ... **7**
7.1 Sample preparation for evaluation of Gd homogeneity in gadolinium fuel blend ... 7
7.2 Sample preparation for determining the Gd_2O_3 content of Gd fuel pellets ... 7

8 Calibration and analysis of the samples ... **7**
8.1 Calibration of Gd peak line intensity ... 7
8.2 Calibration of U peak line intensity ... 7
8.3 Evaluation of Gd homogeneity in gadolinium fuel blend ... 7
8.4 Determination of Gd_2O_3 content in gadolinium fuel pellet ... 8

9 Precision ... **10**

10 Test report ... **10**

Annex A (informative) **Calibration and Gd and U measurement uncertainties** ... **11**

Annex B (informative) **Derivation of O/M and O/U ratio formulas** ... **14**

Annex C (informative) **Evaluation of Gd_2O_3 measurement precision** ... **16**

Bibliography ... **19**