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CCS F46

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 11839-2008

Replacing GB/T 11839-1989

Determination of boron in uranium dioxide pellets by curcumin extraction spectrophotometric method

二氧化铀芯块中硼的测定 姜黄素萃取光度法

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Standardization Administration of China

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Foreword

This standard replaces GB/T 11839-1989 "uranium dioxide pellets - Determination of boron - curcumin extraction spectrophotometry." This standard compared with GB/T 11839-1989, the main changes are as follows:

--- In the "Scope" increase in the content of the provisions;

--- Delete the original standard non-standard representations of the mass volume concentration (m/V);

--- Increased sample representation (see 6.1);

--- Delete the original standard "Appendix A", its contents into the body of the standard;

--- Original standard "Method summary" per gram sample allowed coexisting elements of microgram quantities placed in Appendix A. Appendix A of this standard is a normative appendix. The standard proposed by China National Nuclear Corporation. This standard by the National Standardization Technical Committee of nuclear energy. This standard was drafted. China Jianzhong Nuclear Fuel Limited. The main drafters. Zhang Xixiang, Linwei Zhi. This standard replaces the standards previously issued as follows:

--- GB/T 11839-1989. Determination of uranium dioxide pellets boron Curcumin extraction spectrophotometry

1 Scope

GB/T 11839-2008 is the Chinese national standard on determination of boron in uranium dioxide pellets by curcumin extraction spectrophotometric method, in the field of energy and heat transfer engineering. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 19 June 2008 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 April 2009. Classification: ICS 27.120.30, CCS F46. This page is published from the official record of the standard held by the Chinese standards

administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This standard specifies the uranium dioxide pellets boron determination method feeds, reagents and materials, apparatus and equipment, sample analysis step, the results Calculation and precision of the method. This standard applies to the determination of uranium dioxide pellets of boron, also apply to the determination of the nuclear plain Triuranium of boron. When uranium dioxide sampling When the amount of 0.5g, the boron content is measured range. (0.1 ~ 1.0) μg/g. Per gram of sample allowed coexisting elements of microgram quantities of Appendix A.

2 Method summary

Sample with concentrated sulfuric acid and hydrogen peroxide were dissolved, dehydrated defluorination, boron complexed curcumin produce a red non-aqueous medium acetic acid and sulfuric acid Thereof. After dilution with water, and then cyclohexanone solution containing phenol extraction, filtering the organic phase. Cyclohexanone solution containing phenol as a reference solution, measure Absorbance.

3 Reagents and materials

Unless otherwise stated, only recognized as analytical reagent in the analysis.

3.1 acetone (CH3COCH3), mass fraction of 99.5%.

3.2 Hydrogen peroxide (H2O2), pure class distinctions, mass fraction of 30%.

3.3 High Water Purification method. ion exchange water were placed in a quartz quartz sub-boiling distillation column distillation or (4.4), and add a little mannitol, distilled after storage The presence of a polyethylene bottle.

3.4 acetic acid. Ba (CH3COOH) = 17.4mol/L Purification method. Add 5mL containing 0.4g/mL mannitol and an aqueous solution of acetic acid in 1000mL quartz distiller (4.5). Place Glycerin bath distillation, the initial fraction of 10% was discarded, receiving 70% of middle distillates with a quartz ampoule.

3.5 sulfuric acid, pure class distinctions. Ba (H2SO4) = 17.8mol/L Purification method. Add 60mL sulfuric acid in a platinum dish (4.6), and polyethylene pipette slowly added 30mL hydrofluoric acid (excellent pure), platinum Slice, stir in about 1000W electric heating to take the thick white smoke, remove the cooled repeat the above action. After cooling into a quartz flask.

3.6 Hydrazine sulphate solution. rho (H2N · NH2 · H2SO4) = 10mg/mL Weigh 0.5g of hydrazine sulphate into a platinum dish (4.6), add 25mL sulfuric acid (3.5), low dissolved on a hotplate. Transferred to 50mL Quartz flask, dilute to the mark with sulfuric acid (3.5).

3.7 curcumin ($C_{21}H_{20}O_6$) Purification method. Weigh 5g of curcumin into 250mL quartz beaker, 100mL acetone (3.1) and 50mL of high water (3.3) were mixed and dissolved, filtered, and the filtrate was placed in a quartz beaker 72h. Filtration, with high water (3.3) crystals were washed twice. Crystallized into stone British beaker, cover the surface of the quartz dish, bake in the oven at about 100 °C about 6h, and then transferred to a polyethylene bottle storage.

3.8 curcumin solution. rho ($C_{21}H_{20}O_6$) = 1mg/mL Weigh 0.050g curcumin (3.7) placed in 200mL polyethylene bottle was added 50mL of acetic acid (3.4) to dissolve. Curcumin solution put Set time can not exceed 12h.