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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 12162.4-2010

X and gamma reference radiation for calibrating dosimeters and dose rate meters and for determining their response as a function of photon energy -- Part 4: Calibration of area and personal dosimeters in low energy X reference radiation fields

用于校准剂量仪和剂量率仪及确定其能量响应的X和γ参考辐射 第4部分：低能X射线参考辐射场中场所和个人剂量仪的校准

(English Translation)

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Foreword

GB/T 12162 "for calibrating dosimeters and dose rate meters and for determining their response of X and gamma reference radiations" is divided into four parts.

--- Part 1. Radiation characteristics and production methods;

--- Part 2. Energy range of radiation protection is 8keV ~ 1.3MeV and 4MeV ~ 9MeV
reference radiation dose Measurement;

--- Part 3. place dosimeters and personal dosimeters calibration response to determining its

energy and angular response;

--- Part 4. low-energy X-ray radiation reference field sites and personal dosimeters calibration.

This section GB/T Part of 412,162.

This part of GB/T 12162 other part has a close relationship. GB/T 12162.1-2000 describes a photon reference radiation Production and characteristics; GB/T 12162.2-2004 describes the reference radiation dosimetry; GB/T 12162.3-2004 depicts a International Commission on Radiation Units and Measurements (ICRU) the amount of practical radiation protection [1,2,3] and determine the calibration dosimeters and dose rate meter response process Preface; GB/T 12162.4 described for low-energy X reference radiation field of special methods.

This part identical with ISO 4037-4:2004 "for calibrating dosemeters and dose rate meters and for determining their response of X and gamma reference Radiation - Part 4. low-energy X-ray radiation reference field sites and personal dosimeters calibration. " Compared with the original standard, only a series Series of modified to comply with the relevant requirements of national standards, the main change is as follows.

--- Delete the original standard foreword and introduction;

--- Other adaptations.

Appendix A of this section is normative appendix, Appendix B is an informative annex.

This part is proposed by the China National Nuclear Corporation.

This part of the National Nuclear Energy Standardization Technical Committee (SAC/TC58) centralized.

This section drafted by. China Institute of Atomic Energy.

1 Scope

This section GB/T 12162 specifies the reference in the low energy X-ray radiation field calibration options and personal dose (rate) meters and determining field the individual dose (rate) meter energy response and angular response of the method. This section provides an accurate determination of low energy photon radiation spectrum from the air kerma Kinetic energy to Hp (10) and H * (10) of the conversion coefficient, and a method of directly by an appropriate instrument calibration standard according to these quantities.

This section applies to low-energy X-ray radiation field calibration reference sites and personal dose (rate) meters and to determine places and personal dose (Rate) meter energy response and angular response.

2 Normative references

The following documents contain provisions which, through reference GB/T 12162 in this section constitute provisions of this section. For dated reference documents Member, all subsequent amendments (not including errata content) or revisions do not apply to this section, however, encouraged to reach under this section Parties to research agreement to use the latest versions of these documents. For undated reference documents, the latest versions apply to this section.

X and gamma GB/T 12162.1-2000 for calibrating dosimeters and dose rate meters and for determining their response reference radiation first Part I. Radiation characteristics and production methods (idt ISO 4037-1:1996) X and gamma GB/T 12162.2-2004 for calibrating dosimeters and dose rate meters and for determining their response reference radiation 2 Parts. the energy range of radiation protection is 8keV ~ 1.3 MeV and 4 MeV ~ 9 MeV reference radiation dosimetry (ISO 4037-2:1997, IDT) GB/T 12162.3-2004 for calibrating dosimeters and dose rate meters and for determining their response of X and gamma reference radiations 3 Part. place dosimeters and personal dosimeters calibrated response and its energy and angular response is determined (ISO 4037-3:1999, IDT) JJF1059 Measurement Uncertainty and representation no. ICRU51 report quantities and units of radiation protection dosimetry

3 Terms and Definitions

And the following terms and definitions GB/T 12162.3-2004 established applicable to this section.

Low-energy X-ray reference radiation lowenergyX-rayreferenceradiation GB/T 12162.1-2000 and GB/T 12162.3-2004 specified nominal tube voltage lower than 30kV (including 30kV) by Radiation quality.

Note: These radiation qualities for all filters and fluorescence radiation beam reference radiation.

Spectral fluence Fluence Φ function of photon energy E distribution.

$\Phi(E) = d\Phi/dE$