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

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Replacing GB/T 16148-2009

**Method of estimation for the intake and internal dose of
radionuclides**

放射性核素摄入量及内照射剂量估算方法

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2 Normative references

This document has no normative references.

4 Ingestion routes and patterns

- 4.1 Models of the intake, transfer and excretion pathways of radionuclides are shown in Appendix A, A.1.
- 4.2 The description of the human respiratory tract model is shown in A.2.
- 4.3 The description of the human digestive tract model is shown in A.3.
- 4.4 Description of wound and intact skin intake is given in A.4.

5 Estimation of Radionuclide Intake

5.1 General Methods The results of direct measurements of radionuclides in the whole body, organs, or tissues should be used, while indirect measurements of radionuclides in biological samples should be used. The measurement results of radionuclides or the measurement results of radionuclides in environmental samples, combined with the route of intake, time of intake, and radioactive nuclide content. The radiation properties and biodynamic behavior of elements (a series of complex biological behaviors from the entry of a substance into the body to its excretion, generally described by one or more elements) (A complex model is used to represent this) to estimate the intake of radionuclides.

5.2 Occupational exposure

- 5.2.1 For special monitoring and mission-related monitoring, the intake of a certain radionuclide in the body can be estimated using formula (1).
- 5.2.2 When estimating radionuclide intake in an inhalation mode using air sampling methods, if the measurement result is the cumulative radioactivity during the estimation

period... When the result is the activity concentration of a nuclide in the air, it can be directly considered as the intake at that time. When the measurement result is the activity concentration of a nuclide in the air, it can be calculated using formula (2).

5.2.3 When estimating the intake of a certain radionuclide in the body under continuous intake (e.g., routine monitoring), formula (3) can be used. calculate.

5.3 Public Exposure

5.3.1 The estimation of individual radionuclide intake in the general public can generally refer to the method in 5.2.1.

5.3.2 When estimating radionuclide intake under individual inhalation patterns using air sampling methods, the method in

5.2.2 can be referred to, but special attention should be paid to... Choose an appropriate respiratory rate parameter based on age. The respiratory rate values recommended in ICRP Publication 66 can be used; for adults (over 17 years old)...

1.5 Bq·m⁻³, for children under 1 year old, 1-2 years old (excluding 2 years old), 2-7 years old (excluding 7 years old), 7-12 years old (excluding 12 years old) and The recommended values for the 12-17 year age group are

0.19 Bq·m⁻³,

0.35 Bq·m⁻³,

0.57 Bq·m⁻³,

1.12 Bq·m⁻³, and [missing values].

5.3.3 When it is impossible to estimate according to the methods in

5.2.2 and there is indeed a route of ingestion, as a supplementary method, food and beverages may be used. The amount of water consumed, combined with the measurement results of radionuclides in these substances, is used to estimate the amount of radionuclides ingested by individuals in the public, using formula (4). calculate.

6 Internal radiation dose estimation and methods

6.1 The logic diagram for estimating radionuclide intake and internal radiation dose is shown in Appendix B.

6.2 Internal radiation dose estimation is generally calculated using formula (5).

6.3 The following methods can also be used to estimate the internal radiation dose of occupational exposure.

7. Uncertainties in estimating radionuclide intake and internal radiation dose Uncertainties in

the estimation of radionuclide intake and internal irradiation are given in Appendix G.

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