

DEPARTMENT OF HEALTH AND MENTAL HYGIENE  
BOARD OF HEALTH

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NOTICE OF INTENTION

TO AMEND ARTICLE 175 OF THE NEW YORK CITY HEALTH CODE

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**NOTICE OF PUBLIC HEARING**

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In compliance with §1043(b) of the New York City Charter (the “Charter”) and pursuant to the authority granted to the Board of Health by §558 of said Charter, notice is hereby given of the proposed amendment of Article 175 of the New York City Health Code (the “Health Code”).

NOTICE IS HEREBY GIVEN THAT THE DEPARTMENT OF HEALTH AND MENTAL HYGIENE WILL HOLD A PUBLIC HEARING ON THE PROPOSAL ON MONDAY, JULY 21, 2008 FROM 10AM TO 12PM IN THE THIRD FLOOR BOARDROOM (ROOM 330) AT 125 WORTH STREET, NEW YORK, NEW YORK 10013.

PERSONS INTERESTED IN PRE-REGISTERING TO SPEAK SHOULD NOTIFY, IN WRITING, RENA BRYANT, SECRETARY TO THE BOARD OF HEALTH, 125 WORTH STREET CN-31, NEW YORK, NEW YORK; (212) 788-5010 BY FRIDAY, JULY 18, 2008 PLEASE INCLUDE A TELEPHONE NUMBER WHERE, IF NECESSARY, YOU MAY BE REACHED DURING NORMAL BUSINESS HOURS. SPEAKERS WILL BE LIMITED TO FIVE (5) MINUTES.

PERSONS WHO REQUEST THAT A SIGN LANGUAGE INTERPRETER OR OTHER FORM OF REASONABLE ACCOMMODATION FOR A DISABILITY BE PROVIDED AT THE HEARING ARE ASKED TO NOTIFY RENA BRYANT, SECRETARY TO THE BOARD OF HEALTH, 125 WORTH STREET CN-31, NEW YORK, NEW YORK 10013; (212) 788-5010 BY MONDAY, JULY 21, 2008.

REGISTRATION WILL BE ACCEPTED AT THE DOOR UNTIL 12 PM. HOWEVER, PREFERENCE WILL BE GIVEN TO THOSE WHO PREREGISTER.

WRITTEN COMMENTS REGARDING THE PROPOSAL ADDRESSED TO THE ATTENTION OF THE BOARD OF HEALTH MUST BE SUBMITTED TO RENA BRYANT, SECRETARY TO THE BOARD OF HEALTH, BY MAILING TO 125 WORTH STREET CN-31, NEW YORK, NEW YORK 10013, BY FAX TO (212) 788-4315, OR BY E-MAIL TO [RESOLUTIONCOMMENTS@HEALTH.NYC.GOV](mailto:RESOLUTIONCOMMENTS@HEALTH.NYC.GOV) ON OR BEFORE 5PM ON MONDAY, JULY 21, 2008.

WRITTEN COMMENTS RECEIVED BY THE SECRETARY TO THE BOARD OF HEALTH AND A TRANSCRIPT OF THE PUBLIC HEARING WILL BE AVAILABLE FOR PUBLIC INSPECTION WITHIN A REASONABLE TIME AFTER RECEIPT, BETWEEN THE HOURS OF 9:00 A.M. AND 5:00 P.M. AT THE OFFICE OF THE SECRETARY. THE DEPARTMENT’S GENERAL POLICY IS TO MAKE WRITTEN COMMENTS AVAILABLE FOR PUBLIC VIEWING ON THE INTERNET. ALL COMMENTS RECEIVED, INCLUDING ANY PERSONAL INFORMATION PROVIDED, WILL BE POSTED WITHOUT CHANGE TO <http://www.nyc.gov/html/doh/html/comment/comment.shtml>.

### **STATUTORY AUTHORITY**

These amendments to the New York City Health Code (“Health Code”) are proposed pursuant to Sections 556, 558 and 1043 of the New York City Charter (“Charter”) and applicable state and federal law. Section 556 of the Charter grants the New York City Department of Health and Mental Hygiene (“Department”) jurisdiction to regulate matters affecting health in New York City (“NYC”). Specifically, Section 556 (c)(11) of the Charter authorizes the Department to regulate all aspects of ionizing radiation within the 5 boroughs of New York City. Sections 558 (b) and (c) of the Charter empower the Board of Health to amend the Health Code and to include in the Health Code all matters to which the Department’s authority extends. Section 1043 of the Charter grants rule-making powers to the Department. The New York State (“NYS”) Sanitary Code (i.e., 10 NYCRR §16.1(b)(3)) delegates radiation licensure regulation to those localities that have a population of more than 2,000,000, provided that said requirements are consistent with NYS Sanitary Code requirements. Section 274 of the federal Atomic Energy Act of 1954 (the Act) (codified at 42 USC §2021) authorizes “Agreement States” to regulate byproduct material, source material and special nuclear material in quantities not sufficient to form a critical mass. New York State is an “Agreement State” within the meaning of the Act, and the New York City Department of Health and Mental Hygiene is a component of and a party to the relevant Agreement.

### **STATEMENT OF BASIS AND PURPOSE**

New York State is an Agreement State, which means that this State and the United States Nuclear Regulatory Commission (NRC) have entered into an agreement under the Atomic Energy Act, which delegates authority to NYS to regulate radioactive material at non-reactor sites within its jurisdiction. The New York State Agreement is comprised of three regulatory programs – 1. the New York State Department of Health, 2. the New York State Department of Environmental Conservation, and 3. the New York City Department of Health and Mental Hygiene. Under this Agreement State structure, the New York City Department of Health and Mental Hygiene (Department), through the Office of Radiological Health (ORH), regulates radioactive material for medical, research and academic purposes within the five boroughs of New York City.

ORH licenses and inspects radioactive materials facilities for compliance with Article 175 of the New York City (NYC) Health Code (NYC Health Code or Health Code) for the protection of the health and safety of patients, radiation program employees and the general public. There are about 375 licensed sites in New York City possessing radioactive material for medical, academic and research purposes. ORH inspects these facilities at frequencies of once every one, two or three years depending on the type of usage.

Each Agreement State program is required to maintain compatibility with the NRC regulatory program. The NRC ensures an adequate level of compatibility through its Integrated Materials Performance Evaluation Program (IMPEP) and conducts a quadrennial review of Agreement State programs. The latest IMPEP review of the NYS program took place in November of 2006.

In their November 2006 IMPEP review, the NRC evaluated each of the three components of the New York State Agreement State structure. NRC findings were presented in their Final Report, dated January 31, 2007.

The NRC IMPEP Final Report concluded that NRC requirements (Items 1 and 2 below) needed to be incorporated into Article 175 of the New York City Health Code in order to maintain appropriate compatibility with applicable federal regulations. Item 3 below is an NRC requirement that must be incorporated into the Health Code pursuant to NRC Order EA-07-305 (72 FR 70901).

1. **“Financial Assurance for Materials Licensees,” (published in 68 FR 57327) that became effective on December 3, 2003 and was due for Agreement State adoption by December 3, 2006.**

The NRC amended its regulations (located at 10 CFR Parts 30, 40, and 70) in 2003 for financial assurance for certain materials licensees, including all waste brokers, to bring the amount of financial assurance required more in line with current decommissioning costs. The objective of this action was to ensure that licensees maintain adequate financial assurance so that timely decommissioning can be carried out following shutdown of a licensed facility. Therefore, language in Health Code §175.101(n) is now being modified accordingly.

2. **“Compatibility with IAEA Transportation Safety Standards and other Transportation Safety Amendments,” (published in 69 FR 3698) that became effective on October 1, 2004 and was due for Agreement State adoption by October 1, 2007.**

The NRC amended its regulations (located at 10 CFR Part 71) in 2004 on packaging and transporting radioactive material. This rulemaking was designed to ensure that federal regulations would be compatible with the latest version of the International Atomic Energy Agency (IAEA) standards and to codify other applicable requirements. Therefore, language in Health Code §§ 175.02, 175.105 and 175.105 Appendix A is now being modified accordingly.

3. **NRC Order EA-07-305 (published in 72 FR 70901) imposing fingerprinting and criminal history records check requirements for unescorted access to certain radioactive materials that became effective for Agreement States on December 5, 2007.**

Pursuant to its Order EA-07-305, the NRC has determined that a fingerprinting and criminal history records check requirement shall be imposed on all licensees, including Agreement State licensees, who are subject to Increased Controls (see NRC Order EA 05-090). Agreement States are charged with issuing their equivalent fingerprinting and criminal history records check requirements by June 5, 2008. Section 652 of the Energy Policy Act of 2005 (EPAct), which became law on August 8, 2005, amended Section 149 of the Atomic Energy Act (AEA) to require fingerprinting and a Federal Bureau of Investigation (FBI) identification and criminal history records check for "any individual who is permitted unescorted access to radioactive materials or other property subject to regulation by the Commission that the Commission determines to be of such significance to the public health and safety or the common defense and security as to warrant fingerprinting and background checks." Section 149 of the AEA also requires that "all fingerprints obtained by a licensee or applicant \* \* \* shall be submitted to the Attorney General of the United States through the Commission for identification and a criminal history records check." NRC has decided to implement this requirement, prior to the completion of a future rulemaking, which will implement these provisions of the EPAct, because a deliberate malevolent act by an individual with unescorted access to these radioactive materials has the potential to result in significant adverse impacts to the public health and safety.

Pursuant to a previous NRC Order EA 05-090 (located at 70 FR 72128, December 1, 2005), the NRC ordered all licensees who, at any given time, possess certain radioactive sources in certain quantities to comply with certain Increased Controls (ICs). The purpose of the ICs Order for radioactive sources was to enhance control of radioactive material in order to reduce the risk of unauthorized use of radioactive materials, through access controls to aid prevention, and prompt detection, assessment, and response to mitigate potentially high consequences that would be detrimental to public health and safety. These ICs for radioactive sources and quantities were established to delineate licensee responsibility to maintain control of said licensed material and secure it from unauthorized removal or access.

This NRC Order EA-07-305 (72 FR 70901), imposing fingerprinting and criminal history records check requirements for unescorted access to certain radioactive materials, extends its security requirements applicable to those same IC licensees and became effective on December 5, 2007. Licensees will now be required to submit fingerprints of each individual who the licensee wishes to permit unescorted access to certain licensed materials. The fingerprints would be submitted to the NRC which would then forward them to the FBI. Results of the FBI criminal history record check would be sent to NRC which would then forward them to the licensee. Each licensee shall be responsible for determining whether to allow an individual unescorted access to radioactive materials in quantities of concern. Therefore, language is now being proposed to add these NRC security requirements to Health Code §175.101.

The proposal is as follows:

Note - Matter in brackets [ ] is to be deleted.  
Matter underlined is new.

**RESOLVED**, that subdivision (a) of Section 175.02 of Article 175 of the New York City Health Code, as set forth in Title 24 of the Rules of the City of New York, as last amended by resolution on xxxxxxxxxxxxxxxx, be and the same hereby is amended to update certain definitions relating to the transportation and packaging of radioactive material, to be printed together with explanatory notes, to read as follows:

**§ 175.02. Definitions.**

(a) As used in this Code, the following definitions shall apply:

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(119) “Licensed material” means byproduct, source, or special nuclear material received, possessed, produced, used, transferred or disposed of under a general or specific license issued by the Department or any radioactive material which is subject to the licensure requirement of this Code.

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(126) “Low specific activity (LSA) material” means radioactive material with limited specific activity which is nonfissile or is excepted under § 175.105(b)(2) that satisfies the descriptions and limits set forth below. Shielding materials surrounding the LSA material may not be considered in determining the estimated average specific activity of the package contents. LSA material must be in one of three groups:

(1) LSA-I.

- (i) [Ores containing only naturally occurring radionuclides (e.g., uranium, thorium) and uranium or thorium concentrates of such ores;] Uranium and thorium ores, concentrates of uranium and thorium ores, and other ores containing naturally occurring radioactive radionuclides which are not intended to be processed for the use of these radionuclides;  
or

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(3) LSA-III. Solids (e.g., consolidated wastes, activated materials) excluding powders, that satisfy the requirements of § 71.77 in which:

(iii) The estimated average specific activity of the solid does not exceed  $2 \times 10^{-3}$  A2/g.

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(147) "Package" means the packaging together with its radioactive contents as presented for transport.

- (1) "Fissile material package" or Type AF package, Type BF package, Type B(U)F package, or Type B(M)F package means a fissile material packaging together with its fissile material contents.
- (2) Type A package means a Type A packaging together with its radioactive contents. A Type A package is defined and must comply with DOT regulations in 49 CFR Part 173.

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Notes: The Board of Health proposes that certain definitions contained in §175.02(a) be updated in order to maintain compatibility with NRC definitions found in 10 CFR § 71.4 relating to the transportation and packaging of radioactive material.

**RESOLVED**, that subdivisions (k) and (n) of Section 175.101 of Article 175 of the New York City Health Code, as set forth in Title 24 of the Rules of the City of New York, as last amended by resolution on xxxxxxxxxxxxxxxxx, be and the same hereby is amended to impose fingerprinting and criminal history records check requirements for certain licensees for individuals allowed unescorted access to certain radioactive materials and to update requirements for financial assurance and decommissioning of licensed facilities, to be printed together with explanatory notes, to read as follows:

**§175.101 General requirements for radioactive materials licenses.**

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(k) *Conditions of specific licenses.*

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(3) All licensees subject to the criteria to implement Increased Controls pursuant to the U.S. Nuclear Regulatory Commission (NRC) Order EA 05-090, 70 FR 72128, dated December 1, 2005, shall have as part of their Increased Control Program, a Fingerprinting and Criminal History Records Check procedure established for all individuals whom the licensee wishes to allow unescorted access to radioactive material quantities of concern. Such Fingerprinting and Criminal History Records Check procedures shall adhere to the requirements in NRC Order EA-07-305, 72 FR 70901, or any successor order, law or regulation. The requirements of this provision shall apply to all affected licensees upon its effective date.

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(n) *Financial assurance and recordkeeping for decommissioning.*

(1)(a) Each applicant for a specific license authorizing the possession and use of unsealed radioactive material of half-life greater than 120 days and in quantities exceeding  $10^5$  times the applicable quantities set forth in Appendix B to this section shall submit a decommissioning funding plan as described in §175.101(n)(5). The decommissioning funding plan must also be

submitted when a combination of isotopes is involved if R divided by  $10^5$  is greater than one (1) (unity rule), where R is defined here as the sum of the ratios of the quantity of each isotope to the applicable value in Appendix B to this section.”

(1)(b) Each holder of, or applicant for, any specific license authorizing the possession and use of sealed sources or plated foils of half-life greater than 120 days and in quantities exceeding  $10^{12}$  times the applicable quantities set forth in Appendix B to this section shall submit a decommissioning funding plan as described in §175.101(n)(5). The decommissioning funding plan must also be submitted when a combination of isotopes is involved [of] if R, as defined in §175.101(n)(1)(a), divided by  $10^{12}$  is greater than one (1) (unity rule)], where R is defined as the sum of the ratios of the quantity of each isotope to the applicable value in Appendix B]. The decommissioning funding plan must be submitted to the Department within 2 years of the effective date of this provision.”

(2) Each applicant for a specific license authorizing possession and use of radioactive material of half-life greater than 120 days and in quantities specified in § 175.101(n)(4) shall either:

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(ii) submit a certification that financial assurance for decommissioning has been provided in the amount prescribed by §175.101(n)(4) using one of the methods described in §175.101(n)(6). For an applicant, this certification may state that the appropriate assurance will be obtained after the application has been approved and the license issued[,] but [prior to]before the receipt of licensed material. If the applicant defers execution of the financial instrument until after the license has been issued, a signed original of the financial instrument obtained to satisfy the requirements of paragraph §175.101(n)(6) of this section must be submitted to the Department prior to receipt of licensed material. If the applicant does not defer execution of the financial instrument, the applicant shall submit to the Department [As] as part of the certification, a [copy] signed original of the financial instrument obtained to satisfy the requirements of paragraph §175.101(n)(6) of this section. [is to be submitted to the Department.]”

(3)(i) Each holder of a specific license issued on or after [August 1, 1994]July 27, 1990, which is of a type described in §175.101(n)(1) or (2), shall provide financial assurance for decommissioning in accordance with the criteria set forth [herein] in this section.”

(ii) Each holder of a specific license issued before [August 1, 1994]July 27, 1990, and of a type described in §175.101(n)(1) shall submit[, by January 1, 1995,] a decommissioning funding plan as described in §175.101(n)(5) or a certification of financial assurance for decommissioning in an amount at least equal to [ $\$750,000$ ] $\$1,125,000$  in accordance with the criteria set forth [herein]in this section. If the licensee submits the certification of financial assurance rather than a decommissioning funding plan [at this time], the licensee shall include a decommissioning funding plan in any application for license renewal. Licensees required to submit the  $\$1,125,000$  amount must do so within 1 year of the effective date of this provision.”

(iii) Each holder of a specific license issued before [August 1, 1994]July 27, 1990, and of a type described in §175.101(n)(2), shall submit, by January 1, 1995, a certification of financial assurance for decommissioning or a decommissioning funding plan in accordance with the criteria set forth herein.”

(iv) Each holder of a specific license issued before July 27, 1990, and of a type described in §175.101(n)(1) or §175.101(n)(2) shall submit a decommissioning funding plan as described in §175.101(n)(5) or a certification of financial assurance for decommissioning in an amount at least equal to \$1,125,000 in accordance with the criteria set forth in this section. If the licensee submits the certification of financial assurance rather than a decommissioning funding plan, the licensee shall include a decommissioning funding plan in any application for license renewal.”

(4) Table of required amounts of financial assurance for decommissioning by quantity of material. Licensees required to submit the \$1,125,000 amount must do so within 1 year of the effective date of this provision. Licensees required to submit the \$113,000 or \$225,000 amount must do so within 18 months of the effective date of this provision. Licensees having possession limits exceeding the upper bounds of this table must base financial assurance on a decommissioning funding plan.

(i) Greater than  $10^4$  but less than or equal to  $10^5$  times the applicable quantities of Appendix B to this section in unsealed form (for a combination of isotopes, if R, as defined in §175.101(n)(1)(a) [herein], divided by  $10^4$  is greater than 1, but R divided by  $10^5$  is less than or equal to 1)—[\$750,000] \$1,125,000.

(ii) Greater than  $10^3$  but less than or equal to  $10^4$  times the applicable quantities of Appendix B to this section in unsealed form (for a combination of isotopes, if R, as defined in §175.101(n)(1)(a) [herein], divided by  $10^3$  is greater than 1, but R divided by  $10^4$  is less than or equal to 1)—[\$150,000] \$225,000.

(iii) Greater than  $10^{10}$  but less than or equal to  $10^{12}$  times the applicable quantities of Appendix B to this section in sealed sources or plated foils (for a combination of isotopes, if R, as defined in §175.101(n)(1)(a) [herein], divided by  $10^{10}$  is greater than 1, but R divided by  $10^{12}$  is less than or equal to 1)—[\$75,000] \$113,000.

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Notes: The Board of Health proposes that new language be added to Health Code §175.101(k) pursuant to NRC Order EA-07-305 to incorporate a fingerprinting and criminal history records check requirement on licensees, who possess certain radioactive materials in quantities of concern. This requirement applies to those employees of affected licensees who are allowed unescorted access to certain radioactive materials in quantities of concern. Also, the Board is proposing that several provisions of §175.101(n) of the Health Code be amended and a new §175.101(n)(3)(iv) be added in order to assure compatibility with applicable NRC regulations concerning financial assurance and decommissioning of a licensed facility. The NRC amended its regulations (e.g., 10 CFR §§ 30.35, 40.36, and 70.25) for financial assurance for certain materials licensees to bring the amount of financial assurance required more in line with current decommissioning costs. The objective of this action is to ensure that licensees maintain adequate financial assurance so that timely decommissioning can be carried out following shutdown of a licensed facility.

**RESOLVED**, that Section 175.105 and Appendix A of Section 175.105, of Article 175 of the New York City Health Code, as set forth in Title 24 of the Rules of the City of New York, as last amended by resolution on xxxxxxxxxxxxxxxx, be and the same hereby is amended to update requirements for the transport and packaging of radioactive materials and that Appendix A of Section 175.105 be repealed and reenacted in its entirety, to be printed together with explanatory notes, to read as follows:

## § 175.105. Transportation and Packaging of Radioactive Materials.

- (a) *General Provisions.*  
(1) *Purpose and Scope.*

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(ii) This section applies to any [person who delivers licensed material to a carrier for transport, transports the material outside the confines of the person's facility, plant or authorized site of usage, or transport that material on public highways or into any public area] licensee authorized by specific or general license issued by the Department to receive, possess, use, or transfer licensed material, if the licensee delivers that material to a carrier for transport, transports the material outside the site of usage as specified in the Department license, or transports that material on public highways. No provision of this section authorizes possession of licensed material.

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- (5) *Definitions.*

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(ii) "Certificate of Compliance (CoC)" means the certificate issued by the NRC which approves the design of a package for the transportation of radioactive material.

[(ii)] (iii) "Close reflection by water" means immediate contact by water of sufficient thickness for maximum reflection of neutrons.

[(iii)] (iv) "Containment system" means the assembly of components of the packaging intended to retain the radioactive material during transport.

(v) "Criticality Safety Index (CSI)" means the dimensionless number (rounded up to the next tenth) assigned to and placed on the label of a fissile material package, to designate the degree of control of accumulation of packages containing fissile material during transportation. Determination of the criticality safety index is described in 10 CFR §§71.22, 71.23, and 71.59.

[(iv)] (vi) "Low toxicity alpha emitters" means natural uranium, depleted uranium, natural thorium; uranium-235, uranium-238, thorium-232, thorium-228 or thorium-230 when contained in ores or physical or chemical concentrates or tailings; or alpha emitters with a half-life of less than 10 days.

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[(vii)] (ix) "Optimum interspersed hydrogenous moderation" means the presence of hydrogenous material between packages to such an extent that the maximum nuclear reactivity results.

(x) "Spent nuclear fuel" means fuel that has been withdrawn from a nuclear reactor following irradiation, has undergone at least 1 year's decay since being used as a source of energy in a power reactor, and has not been chemically separated into its constituent elements by reprocessing. Spent fuel includes the special nuclear material, byproduct material, source material, and other radioactive materials associated with fuel assemblies.

[(viii)] (xi) "Surface Contaminated Object (SCO)" means a solid object that is not itself classed as radioactive material, but which has radioactive material distributed on any of its surfaces. SCO must be in one of two groups with surface activity not exceeding the following limits:..."

(xii) "Unirradiated uranium" means uranium containing not more than  $2 \times 10^3$  Bq of plutonium per gram of uranium-235, not more than  $9 \times 10^6$  Bq of fission products per gram of uranium-235, and not more than  $5 \times 10^{-3}$  g of uranium-236 per gram of uranium-235.

(6) *Transportation of licensed material.*

- (i) Each [person] licensee who transports licensed material outside the site of usage, as specified in the license or where transport is on public highways, or who delivers licensed material to a carrier for transport, shall comply with the applicable requirements of the USDOT regulations in 49 CFR Parts 170 through 189 appropriate to the mode of transport.
- (A) The [person] licensee shall particularly note DOT regulations in the following areas:

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(b) *Exemption.*

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(2) *Exemption for low-level materials.*

- (i) A licensee is exempt from all requirements of this section with respect to shipment or carriage of [a package containing radioactive material having a specific activity not greater than 70 Bq/g (0.002 ;gmCi/g).]the following low-level materials:
  - (A) Natural material and ores containing naturally occurring radionuclides that are not intended to be processed for use of these radionuclides, provided the activity concentration of the material does not exceed 10 times the values specified in Appendix A, Table A-2 of this section.
  - (B) Materials for which the activity concentration is not greater than the activity concentration values specified in Appendix A, Table A-2 of this section , or for which the consignment activity is not greater than the limit for an exempt consignment found in Appendix A, Table A-2 of this section.

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(3) *Exemption from classification as fissile material.*

- (i) Fissile material meeting the requirements of at least one of the paragraphs of this section are exempt from classification as fissile material and from the fissile material package standards of 10 CFR §§ 71.55 and 71.59, but are subject to all other requirements of this part, except as noted.
- (ii) Individual package containing 2 grams or less of fissile material
- (iii) Individual or bulk packaging containing 15 grams or less of fissile material provided the package has at least 200 grams of solid nonfissile material for every gram of fissile material. Lead, beryllium, graphite and hydrogenous material enriched in deuterium may be present in the package but must not be included in determining the required mass for solid monticule material.
- (iv) Low concentrations of solid fissile material commingled with solid nonfissile material provided that:
  - (A) There is a least 2000 grams of solid nonfissile material for every gram of fissile material, and

- (B) There is no more than 180 grams of fissile material distributed within 360 kg of contiguous nonfissile material.
- (C) Lead, beryllium, graphite, and hydrogenous material may be present in the package but must not be included in determining the required mass of solid nonfissile material.
- (v) Uranium enriched in uranium-235 to a maximum of 1 percent by weight, and with a total plutonium and uranium-233 content of up to 1 percent of the mass of the uranium -235, provided that the mass of any beryllium, graphite, and hydrogenous material enriched in deuterium constitutes less than 5 percent of the uranium mass.
- (vi) Liquid solutions of uranyl nitrate enriched in uranium-235 to a maximum of 2 percent by mass, with a total plutonium and uranium-233 content not exceeding 0.002 percent of the mass of uranium, and with a minimum nitrogen to uranium atomic ratio (N/U) of 2. The material must be contained in at least a DOT Type A package.

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(c) *General licenses.*

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(5) General License: Fissile Material.

- (i) A general license is issued to any licensee of the Department to transport fissile material, or to deliver fissile material to a carrier for transport, if the material is shipped in accordance with this section. The fissile material need not be contained in a package which meets the standards of subparts E and F of 10 CFR 71.22; however the material must be contained in a Type A package. The Type A package must also meet the DOT requirements of 49 CFR 173.417(a).
- (ii) The general license applies only to a licensee who has a quality assurance program approved by the Department as satisfying the provisions of §175.105(e) of this part
- (iii) The general license applies only when a package's contents:
  - (A) Contain less than a Type A quantity of fissile material; and
  - (B) Contains less than 500 total grams of beryllium, graphite, or hydrogenous material enriched in deuterium.
- (iv) The general license applies only to packages containing fissile material that are labeled with a CSI which:
  - (A) Has been determined in accordance with section (5) of this section
  - (B) Has a value less than or equal to 10; and
  - (C) For a shipment of multiple packages containing fissile material, the sum of the CSIs must be less than or equal to 50 (for shipment on a nonexclusive use conveyance) and less than or equal to 100 (for shipment on an exclusive use conveyance).
- (v) (A) The value for the CSI must be greater than or equal to the number calculated by the following equation:
  - (B) The calculated CSI must be rounded up to the first decimal place;
  - (C) The values of X, Y, and Z used in the CSI equation must be taken from Tables-71.1 or 71.2, as appropriate;
  - (D) If Table 71-2 is used to obtain the value of X, then the values of for the terms in the equation for uranium-233 and plutonium must be assumed to be zero; and,
  - (E) Table 71-1 values for X, Y, and Z must be used to determine the CSI if:
    - (a) Uranium-233 is present in the package;
    - (b) The mass of plutonium exceeds 1 percent of the mass of uranium-235;
    - (c) The uranium is o unknown uranium-235 enrichment or greater than 24 weight percent enrichment; or

(d) Substances having a moderating effectiveness (i.e., an average hydrogen density greater than H<sub>2</sub>O) (e.g., certain hydrocarbon oils or plastics) are present in any form, except as polyethylene used for packing or wrapping.

(6) General license: Plutonium/Beryllium special form material.

(i) A general license is issued to any licensee of the Department to transport fissile material in the form of plutonium-beryllium (Pu-Be) special form sealed sources, or to deliver Pu-Be sealed sources to a carrier for transport, if the material is shipped in accordance with this section. This material need not be contained in a package which meets the standards of subparts E and F of 10 CFR 71; however, the material must be contained in a Type A package. The Type A package must also meet the DOT requirements of 49 CFR 173.417(a).

(ii) The general license applies only to a licensee who has a quality assurance program approved by the Department as satisfying § 175.105(e)(1) of this section.

(iii) The general license applies only when a package's contents:

(A) Contain less than a Type A quantity of material; and

(B) Contain less than 1000 g of plutonium, provided that: plutonium-239, plutonium-241, or any combination of these radionuclides, constitute less than 240 g of the total quantity of plutonium in the package.

(iv) The general license applies only to packages labeled with a CSI which:

(A) Has been determined in accordance with part (v) of this section;

(B) Has a value less than or equal to 100;

(C) For a shipment of multiple packages containing Pu-Be sealed sources, the sum of the CSI must be less than or equal to 50 (for shipment on a nonexclusive use conveyance) and less than or equal to 100 (for shipment on an exclusive use conveyance).

(v) (A) The value for the CSI must be greater than or equal to the number calculated by the following equation:

$$\text{CSI} = 10 \left[ \frac{\text{grams of } ^{239}\text{Pu} + \text{grams of } ^{241}\text{Pu}}{24} \right]; \text{ and}$$

(B) The calculated CSI must be rounded up to the first decimal place.

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(d) Operating Controls and Procedures.

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(3) Routine determinations.

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(xii) When the isotopic abundance, mass, concentration, degree of irradiation, degree of moderation, or other pertinent property of fissile material in any package is not known, the licensee shall package the fissile material as if the unknown properties have credible values that will cause the maximum neutron multiplication.

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(9) Advance notification of shipment of irradiated reactor fuel and nuclear waste.

(iii) Procedures for submitting advance notification.

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(C) A notification delivered by [messenger] any other means than mail must reach the office of the governor or of the governor's designee and the Department at least 4 days before the beginning of the 7-day period during which departure of the shipment is estimated to occur.

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## **Appendix A -- Determination of A<sub>1</sub> and A<sub>2</sub>**

I. Values of A<sub>1</sub> and A<sub>2</sub> for individual radionuclides, which are the bases for many activity limits elsewhere in this Code, are given in Table A-1. The curie (Ci) values specified are obtained by converting from the Terabecquerel (TBq) value. The Terabecquerel values are the regulatory standard. The curie values are for information only and are not intended to be the regulatory standard. Where values of A<sub>1</sub> and A<sub>2</sub> are unlimited, it is for radiation control purposes only. For nuclear criticality safety, some materials are subject to controls placed on fissile material.

II. a. For individual radionuclides whose identities are known, but which are not listed in Table A-1, the A<sub>1</sub> and A<sub>2</sub> values contained in Table A-3 may be used. Otherwise, the licensee shall obtain prior Department approval of the A<sub>1</sub> and A<sub>2</sub> values for radionuclides not listed in Table A-1, before shipping the material.

b. For individual radionuclides whose identities are known, but which are not listed in Table A-2, the exempt material activity concentration and exempt consignment activity values contained in Table A-3 may be used. Otherwise, the licensee shall obtain prior Department approval of the exempt material activity concentration and exempt consignment activity values for radionuclides not listed in Table A-2, before shipping the material.

c. The licensee shall submit requests for prior approval, described under paragraphs II(a) and II(b) of this Appendix, to the Department.

III. In the calculations of A<sub>1</sub> and A<sub>2</sub> for a radionuclide not in Table A-1, a single radioactive decay chain, in which radionuclides are present in their naturally occurring proportions, and in which no daughter radionuclide has a half-life either longer than 10 days, or longer than that of the parent radionuclide, shall be considered as a single radionuclide, and the activity to be taken into account, and the A<sub>1</sub> or A<sub>2</sub> value to be applied, shall be those corresponding to the parent radionuclide of that chain. In the case of radioactive decay chains in which any daughter radionuclide has a half-life either longer than 10 days, or greater than that of the parent radionuclide, the parent and those daughter radionuclides shall be considered as mixtures of different radionuclides.

IV. For mixtures of radionuclides whose identities and respective activities are known, the following conditions apply:

a. For special form radioactive material, the maximum quantity transported in a Type A package is as follows:

$$\sum_i \frac{B(i)}{A_1(i)} \leq 1$$

where B(i) is the activity of radionuclide i, and A<sub>1</sub>(i) is the A<sub>1</sub> value for radionuclide i.

b. For normal form radioactive material, the maximum quantity transported in a Type A package is as follows:

$$\sum B(i)/A_2(i) \leq 1$$

where B(i) is the activity of radionuclide i, and A<sub>2</sub>(i) is the A<sub>2</sub> value for radionuclide i.

c. Alternatively, the A<sub>1</sub> value for mixtures of special form material may be determined as follows:

$$A_1 \text{ for mixture} = \frac{1}{\sum_i \frac{f(i)}{A_1(i)}}$$

where  $f(i)$  is the fraction of activity for radionuclide I in the mixture, and  $A_1(i)$  is the appropriate  $A_1$  value for radionuclide I.

d. Alternatively, the  $A_2$  value for mixtures of normal form material may be determined as follows:

$$A_2 \text{ for mixture} = \frac{1}{\sum_i \frac{f(i)}{A_2(i)}}$$

where  $f(i)$  is the fraction of activity for radionuclide I in the mixture, and  $A_2(i)$  is the appropriate  $A_2$  value for radionuclide I.

e. The exempt activity concentration for mixtures of nuclides may be determined as follows:

$$\text{Exempt activity concentration for mixture} = \frac{1}{\sum_i \frac{f(i)}{[A](i)}}$$

where  $f(i)$  is the fraction of activity concentration of radionuclide I in the mixture, and  $[A]$  is the activity concentration for exempt material containing radionuclide I.

f. The activity limit for an exempt consignment for mixtures of radionuclides may be determined as follows:

$$\text{Exempt consignment activity limit for mixture} = \frac{1}{\sum_i \frac{f(i)}{A(i)}}$$

where  $f(i)$  is the fraction of activity of radionuclide I in the mixture, and  $A$  is the activity limit for exempt consignments for radionuclide I.

V. When the identity of each radionuclide is known, but the individual activities of some of the radionuclides are not known, the radionuclides may be grouped, and the lowest  $A_1$  or  $A_2$  value, as appropriate, for the radionuclides in each group may be used in applying the formulas in paragraph IV. Groups may be based on the total alpha activity and the total beta/gamma activity when these are known, using the lowest  $A_1$  or  $A_2$  values for the alpha emitters and beta/gamma emitters.

**Table A-1— $A_1$  and  $A_2$  VALUES FOR RADIONUCLIDES**

<u>Symbol of radionuclide</u>	<u>Element and atomic number</u>	<u><math>A_1</math> (TBq)</u>	<u><math>A_1</math> (Ci)<sup>b</sup></u>	<u><math>A_2</math> (TBq)</u>	<u><math>A_2</math> (Ci)<sup>b</sup></u>	<u>Specific activity</u>	
						<u>(TBq/g)</u>	<u>(Ci/g)</u>
<u>Ac-225 (a)</u>	<u>Actinium (89)</u>	<u><math>8.0 \times 10^{-1}</math></u>	<u><math>2.2 \times 10^1</math></u>	<u><math>6.0 \times 10^{-3}</math></u>	<u><math>1.6 \times 10^{-1}</math></u>	<u><math>2.1 \times 10^3</math></u>	<u><math>5.8 \times 10^4</math></u>
<u>Ac-227 (a)</u>	-	<u><math>9.0 \times 10^{-1}</math></u>	<u><math>2.4 \times 10^1</math></u>	<u><math>9.0 \times 10^{-5}</math></u>	<u><math>2.4 \times 10^{-3}</math></u>	<u>2.7</u>	<u><math>7.2 \times 10^1</math></u>
<u>Ac-228</u>	-	<u><math>6.0 \times 10^{-1}</math></u>	<u><math>1.6 \times 10^1</math></u>	<u><math>5.0 \times 10^{-1}</math></u>	<u><math>1.4 \times 10^1</math></u>	<u><math>8.4 \times 10^4</math></u>	<u><math>2.2 \times 10^6</math></u>
<u>Ag-105</u>	<u>Silver (47)</u>	<u>2.0</u>	<u><math>5.4 \times 10^1</math></u>	<u>2.0</u>	<u><math>5.4 \times 10^1</math></u>	<u><math>1.1 \times 10^3</math></u>	<u><math>3.0 \times 10^4</math></u>
<u>Ag-108m (a)</u>	-	<u><math>7.0 \times 10^{-1}</math></u>	<u><math>1.9 \times 10^1</math></u>	<u><math>7.0 \times 10^{-1}</math></u>	<u><math>1.9 \times 10^1</math></u>	<u><math>9.7 \times 10^{-1}</math></u>	<u><math>2.6 \times 10^1</math></u>

<u>Ag-110m (a)</u>	-	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>1.8X10<sup>2</sup></u>	<u>4.7X10<sup>3</sup></u>
<u>Ag-111</u>	-	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>5.8X10<sup>3</sup></u>	<u>1.6X10<sup>5</sup></u>
<u>Al-26</u>	<u>Aluminum (13)</u>	<u>1.0X10<sup>-1</sup></u>	<u>2.7</u>	<u>1.0X10<sup>-1</sup></u>	<u>2.7</u>	<u>7.0X10<sup>-4</sup></u>	<u>1.9X10<sup>-2</sup></u>
<u>Am-241</u>	<u>Americium (95)</u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>1.0X10<sup>-3</sup></u>	<u>2.7X10<sup>-2</sup></u>	<u>1.3X10<sup>-1</sup></u>	<u>3.4</u>
<u>Am-242m (a)</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>1.0X10<sup>-3</sup></u>	<u>2.7X10<sup>-2</sup></u>	<u>3.6X10<sup>-1</sup></u>	<u>1.0X10<sup>1</sup></u>
<u>Am-243 (a)</u>	-	<u>5.0</u>	<u>1.4X10<sup>2</sup></u>	<u>1.0X10<sup>-3</sup></u>	<u>2.7X10<sup>-2</sup></u>	<u>7.4X10<sup>-3</sup></u>	<u>2.0X10<sup>-1</sup></u>
<u>Ar-37</u>	<u>Argon (18)</u>	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>3.7X10<sup>3</sup></u>	<u>9.9X10<sup>4</sup></u>
<u>Ar-39</u>	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>2.0X10<sup>1</sup></u>	<u>5.4X10<sup>2</sup></u>	<u>1.3</u>	<u>3.4X10<sup>1</sup></u>
<u>Ar-41</u>	-	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>1.5X10<sup>6</sup></u>	<u>4.2X10<sup>7</sup></u>
<u>As-72</u>	<u>Arsenic (33)</u>	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>6.2X10<sup>4</sup></u>	<u>1.7X10<sup>6</sup></u>
<u>As-73</u>	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>8.2X10<sup>2</sup></u>	<u>2.2X10<sup>4</sup></u>
<u>As-74</u>	-	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>9.0X10<sup>-1</sup></u>	<u>2.4X10<sup>1</sup></u>	<u>3.7X10<sup>3</sup></u>	<u>9.9X10<sup>4</sup></u>
<u>As-76</u>	-	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>5.8X10<sup>4</sup></u>	<u>1.6X10<sup>6</sup></u>
<u>As-77</u>	-	<u>2.0X10<sup>1</sup></u>	<u>5.4X10<sup>2</sup></u>	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>3.9X10<sup>4</sup></u>	<u>1.0X10<sup>6</sup></u>
<u>At-211 (a)</u>	<u>Astatine (85)</u>	<u>2.0X10<sup>1</sup></u>	<u>5.4X10<sup>2</sup></u>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>7.6X10<sup>4</sup></u>	<u>2.1X10<sup>6</sup></u>
<u>Au-193</u>	<u>Gold (79)</u>	<u>7.0</u>	<u>1.9X10<sup>2</sup></u>	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>3.4X10<sup>4</sup></u>	<u>9.2X10<sup>5</sup></u>
<u>Au-194</u>	-	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>1.5X10<sup>4</sup></u>	<u>4.1X10<sup>5</sup></u>
<u>Au-195</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>6.0</u>	<u>1.6X10<sup>2</sup></u>	<u>1.4X10<sup>2</sup></u>	<u>3.7X10<sup>3</sup></u>
<u>Au-198</u>	-	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>9.0X10<sup>3</sup></u>	<u>2.4X10<sup>5</sup></u>
<u>Au-199</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>7.7X10<sup>3</sup></u>	<u>2.1X10<sup>5</sup></u>
<u>Ba-131 (a)</u>	<u>Barium (56)</u>	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>3.1X10<sup>3</sup></u>	<u>8.4X10<sup>4</sup></u>
<u>Ba-133</u>	-	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>9.4</u>	<u>2.6X10<sup>2</sup></u>
<u>Ba-133m</u>	-	<u>2.0X10<sup>1</sup></u>	<u>5.4X10<sup>2</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>2.2X10<sup>4</sup></u>	<u>6.1X10<sup>5</sup></u>
<u>Ba-140 (a)</u>	-	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>2.7X10<sup>3</sup></u>	<u>7.3X10<sup>4</sup></u>
<u>Be-7</u>	<u>Beryllium (4)</u>	<u>2.0X10<sup>1</sup></u>	<u>5.4X10<sup>2</sup></u>	<u>2.0X10<sup>1</sup></u>	<u>5.4X10<sup>2</sup></u>	<u>1.3X10<sup>4</sup></u>	<u>3.5X10<sup>5</sup></u>
<u>Be-10</u>	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>8.3X10<sup>-4</sup></u>	<u>2.2X10<sup>-2</sup></u>
<u>Bi-205</u>	<u>Bismuth (83)</u>	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>1.5X10<sup>3</sup></u>	<u>4.2X10<sup>4</sup></u>
<u>Bi-206</u>	-	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>3.8X10<sup>3</sup></u>	<u>1.0X10<sup>5</sup></u>
<u>Bi-207</u>	-	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>1.9</u>	<u>5.2X10<sup>1</sup></u>
<u>Bi-210</u>	-	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>4.6X10<sup>3</sup></u>	<u>1.2X10<sup>5</sup></u>
<u>Bi-210m (a)</u>	-	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>2.0X10<sup>-2</sup></u>	<u>5.4X10<sup>-1</sup></u>	<u>2.1X10<sup>-5</sup></u>	<u>5.7X10<sup>-4</sup></u>
<u>Bi-212 (a)</u>	-	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>5.4X10<sup>5</sup></u>	<u>1.5X10<sup>7</sup></u>
<u>Bk-247</u>	<u>Berkelium (97)</u>	<u>8.0</u>	<u>2.2X10<sup>2</sup></u>	<u>8.0X10<sup>-4</sup></u>	<u>2.2X10<sup>-2</sup></u>	<u>3.8X10<sup>-2</sup></u>	<u>1.0</u>

<u>Bk-249 (a)</u>	-	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>3.0X10<sup>-1</sup></u>	8.1	<u>6.1X10<sup>1</sup></u>	<u>1.6X10<sup>3</sup></u>
<u>Br-76</u>	<u>Bromine (35)</u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>9.4X10<sup>4</sup></u>	<u>2.5X10<sup>6</sup></u>
<u>Br-77</u>	-	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>2.6X10<sup>4</sup></u>	<u>7.1X10<sup>5</sup></u>
<u>Br-82</u>	-	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>4.0X10<sup>4</sup></u>	<u>1.1X10<sup>6</sup></u>
<u>C-11</u>	<u>Carbon (6)</u>	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>3.1X10<sup>7</sup></u>	<u>8.4X10<sup>8</sup></u>
<u>C-14</u>	-	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>1.6X10<sup>-1</sup></u>	4.5
<u>Ca-41</u>	<u>Calcium (20)</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>3.1X10<sup>-3</sup></u>	<u>8.5X10<sup>-2</sup></u>
<u>Ca-45</u>	-	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>6.6X10<sup>2</sup></u>	<u>1.8X10<sup>4</sup></u>
<u>Ca-47 (a)</u>	-	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>3.0X10<sup>-1</sup></u>	8.1	<u>2.3X10<sup>4</sup></u>	<u>6.1X10<sup>5</sup></u>
<u>Cd-109</u>	<u>Cadmium (48)</u>	<u>3.0X10<sup>-1</sup></u>	<u>8.1X10<sup>2</sup></u>	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>9.6X10<sup>1</sup></u>	<u>2.6X10<sup>3</sup></u>
<u>Cd-113m</u>	-	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	8.3	<u>2.2X10<sup>2</sup></u>
<u>Cd-115 (a)</u>	-	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>1.9X10<sup>4</sup></u>	<u>5.1X10<sup>5</sup></u>
<u>Cd-115m</u>	-	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>9.4X10<sup>2</sup></u>	<u>2.5X10<sup>4</sup></u>
<u>Ce-139</u>	<u>Cerium (58)</u>	<u>7.0</u>	<u>1.9X10<sup>2</sup></u>	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>2.5X10<sup>2</sup></u>	<u>6.8X10<sup>3</sup></u>
<u>Ce-141</u>	-	<u>2.0X10<sup>-1</sup></u>	<u>5.4X10<sup>2</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>2.8X10<sup>4</sup></u>
<u>Ce-143</u>	-	<u>9.0X10<sup>-1</sup></u>	<u>2.4X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>2.5X10<sup>4</sup></u>	<u>6.6X10<sup>5</sup></u>
<u>Ce-144 (a)</u>	-	<u>2.0X10<sup>-1</sup></u>	<u>5.4</u>	<u>2.0X10<sup>-1</sup></u>	<u>5.4</u>	<u>1.2X10<sup>2</sup></u>	<u>3.2X10<sup>3</sup></u>
<u>Cf-248</u>	<u>Californium (98)</u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>6.0X10<sup>-3</sup></u>	<u>1.6X10<sup>-1</sup></u>	<u>5.8X10<sup>1</sup></u>	<u>1.6X10<sup>3</sup></u>
<u>Cf-249</u>	-	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>8.0X10<sup>-4</sup></u>	<u>2.2X10<sup>-2</sup></u>	<u>1.5X10<sup>-1</sup></u>	4.1
<u>Cf-250</u>	-	<u>2.0X10<sup>-1</sup></u>	<u>5.4X10<sup>2</sup></u>	<u>2.0X10<sup>-3</sup></u>	<u>5.4X10<sup>-2</sup></u>	4.0	<u>1.1X10<sup>2</sup></u>
<u>Cf-251</u>	-	<u>7.0</u>	<u>1.9X10<sup>2</sup></u>	<u>7.0X10<sup>-4</sup></u>	<u>1.9X10<sup>-2</sup></u>	<u>5.9X10<sup>-2</sup></u>	1.6
<u>Cf-252 (h)</u>	-	<u>5.0X10<sup>-2</sup></u>	1.4	<u>3.0X10<sup>-3</sup></u>	<u>8.1X10<sup>-2</sup></u>	<u>2.0X10<sup>1</sup></u>	<u>5.4X10<sup>2</sup></u>
<u>Cf-253 (a)</u>	-	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>4.0X10<sup>-2</sup></u>	1.1	<u>1.1X10<sup>3</sup></u>	<u>2.9X10<sup>4</sup></u>
<u>Cf-254</u>	-	<u>1.0X10<sup>-3</sup></u>	<u>2.7X10<sup>-2</sup></u>	<u>1.0X10<sup>-3</sup></u>	<u>2.7X10<sup>-2</sup></u>	<u>3.1X10<sup>2</sup></u>	<u>8.5X10<sup>3</sup></u>
<u>Cl-36</u>	<u>Chlorine (17)</u>	<u>1.0X10<sup>-1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>1.2X10<sup>-3</sup></u>	<u>3.3X10<sup>-2</sup></u>
<u>Cl-38</u>	-	<u>2.0X10<sup>-1</sup></u>	<u>5.4</u>	<u>2.0X10<sup>-1</sup></u>	<u>5.4</u>	<u>4.9X10<sup>6</sup></u>	<u>1.3X10<sup>8</sup></u>
<u>Cm-240</u>	<u>Curium (96)</u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>2.0X10<sup>-2</sup></u>	<u>5.4X10<sup>-1</sup></u>	<u>7.5X10<sup>2</sup></u>	<u>2.0X10<sup>4</sup></u>
<u>Cm-241</u>	-	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>6.1X10<sup>2</sup></u>	<u>1.7X10<sup>4</sup></u>
<u>Cm-242</u>	-	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>1.0X10<sup>-2</sup></u>	<u>2.7X10<sup>-1</sup></u>	<u>1.2X10<sup>2</sup></u>	<u>3.3X10<sup>3</sup></u>
<u>Cm-243</u>	-	<u>9.0</u>	<u>2.4X10<sup>2</sup></u>	<u>1.0X10<sup>-3</sup></u>	<u>2.7X10<sup>-2</sup></u>	<u>1.9X10<sup>-3</sup></u>	<u>5.2X10<sup>1</sup></u>
<u>Cm-244</u>	-	<u>2.0X10<sup>-1</sup></u>	<u>5.4X10<sup>2</sup></u>	<u>2.0X10<sup>-3</sup></u>	<u>5.4X10<sup>-2</sup></u>	3.0	<u>8.1X10<sup>1</sup></u>
<u>Cm-245</u>	-	<u>9.0</u>	<u>2.4X10<sup>2</sup></u>	<u>9.0X10<sup>-4</sup></u>	<u>2.4X10<sup>-2</sup></u>	<u>6.4X10<sup>-3</sup></u>	<u>1.7X10<sup>-1</sup></u>
<u>Cm-246</u>	-	<u>9.0</u>	<u>2.4X10<sup>2</sup></u>	<u>9.0X10<sup>-4</sup></u>	<u>2.4X10<sup>-2</sup></u>	<u>1.1X10<sup>-2</sup></u>	<u>3.1X10<sup>-1</sup></u>

<u> Cm-247 (a) </u>	-	<u> 3.0 </u>	<u> 8.1X10<sup>1</sup> </u>	<u> 1.0X10<sup>-3</sup> </u>	<u> 2.7X10<sup>-2</sup> </u>	<u> 3.4X10<sup>-6</sup> </u>	<u> 9.3X10<sup>-5</sup> </u>
<u> Cm-248 </u>	-	<u> 2.0X10<sup>-2</sup> </u>	<u> 5.4X10<sup>-1</sup> </u>	<u> 3.0X10<sup>-4</sup> </u>	<u> 8.1X10<sup>-3</sup> </u>	<u> 1.6X10<sup>-4</sup> </u>	<u> 4.2X10<sup>-3</sup> </u>
<u> Co-55 </u>	<u> Cobalt (27) </u>	<u> 5.0X10<sup>-1</sup> </u>	<u> 1.4X10<sup>1</sup> </u>	<u> 5.0X10<sup>-1</sup> </u>	<u> 1.4X10<sup>1</sup> </u>	<u> 1.1X10<sup>5</sup> </u>	<u> 3.1X10<sup>6</sup> </u>
<u> Co-56 </u>	-	<u> 3.0X10<sup>-1</sup> </u>	<u> 8.1 </u>	<u> 3.0X10<sup>-1</sup> </u>	<u> 8.1 </u>	<u> 1.1X10<sup>3</sup> </u>	<u> 3.0X10<sup>4</sup> </u>
<u> Co-57 </u>	-	<u> 1.0X10<sup>1</sup> </u>	<u> 2.7X10<sup>2</sup> </u>	<u> 1.0X10<sup>1</sup> </u>	<u> 2.7X10<sup>2</sup> </u>	<u> 3.1X10<sup>2</sup> </u>	<u> 8.4X10<sup>3</sup> </u>
<u> Co-58 </u>	-	<u> 1.0 </u>	<u> 2.7X10<sup>1</sup> </u>	<u> 1.0 </u>	<u> 2.7X10<sup>1</sup> </u>	<u> 1.2X10<sup>3</sup> </u>	<u> 3.2X10<sup>4</sup> </u>
<u> Co-58m </u>	-	<u> 4.0X10<sup>1</sup> </u>	<u> 1.1X10<sup>3</sup> </u>	<u> 4.0X10<sup>1</sup> </u>	<u> 1.1X10<sup>3</sup> </u>	<u> 2.2X10<sup>5</sup> </u>	<u> 5.9X10<sup>6</sup> </u>
<u> Co-60 </u>	-	<u> 4.0X10<sup>-1</sup> </u>	<u> 1.1X10<sup>1</sup> </u>	<u> 4.0X10<sup>-1</sup> </u>	<u> 1.1X10<sup>1</sup> </u>	<u> 4.2X10<sup>1</sup> </u>	<u> 1.1X10<sup>3</sup> </u>
<u> Cr-51 </u>	<u> Chromium (24) </u>	<u> 3.0X10<sup>1</sup> </u>	<u> 8.1X10<sup>2</sup> </u>	<u> 3.0X10<sup>1</sup> </u>	<u> 8.1X10<sup>2</sup> </u>	<u> 3.4X10<sup>3</sup> </u>	<u> 9.2X10<sup>4</sup> </u>
<u> Cs-129 </u>	<u> Cesium (55) </u>	<u> 4.0 </u>	<u> 1.1X10<sup>2</sup> </u>	<u> 4.0 </u>	<u> 1.1X10<sup>2</sup> </u>	<u> 2.8X10<sup>4</sup> </u>	<u> 7.6X10<sup>5</sup> </u>
<u> Cs-131 </u>	-	<u> 3.0X10<sup>1</sup> </u>	<u> 8.1X10<sup>2</sup> </u>	<u> 3.0X10<sup>1</sup> </u>	<u> 8.1X10<sup>2</sup> </u>	<u> 3.8X10<sup>3</sup> </u>	<u> 1.0X10<sup>5</sup> </u>
<u> Cs-132 </u>	-	<u> 1.0 </u>	<u> 2.7X10<sup>1</sup> </u>	<u> 1.0 </u>	<u> 2.7X10<sup>1</sup> </u>	<u> 5.7X10<sup>3</sup> </u>	<u> 1.5X10<sup>5</sup> </u>
<u> Cs-134 </u>	-	<u> 7.0X10<sup>-1</sup> </u>	<u> 1.9X10<sup>1</sup> </u>	<u> 7.0X10<sup>-1</sup> </u>	<u> 1.9X10<sup>1</sup> </u>	<u> 4.8X10<sup>1</sup> </u>	<u> 1.3X10<sup>3</sup> </u>
<u> Cs-134m </u>	-	<u> 4.0X10<sup>1</sup> </u>	<u> 1.1X10<sup>3</sup> </u>	<u> 6.0X10<sup>-1</sup> </u>	<u> 1.6X10<sup>1</sup> </u>	<u> 3.0X10<sup>5</sup> </u>	<u> 8.0X10<sup>6</sup> </u>
<u> Cs-135 </u>	-	<u> 4.0X10<sup>1</sup> </u>	<u> 1.1X10<sup>3</sup> </u>	<u> 1.0 </u>	<u> 2.7X10<sup>1</sup> </u>	<u> 4.3X10<sup>-5</sup> </u>	<u> 1.2X10<sup>-3</sup> </u>
<u> Cs-136 </u>	-	<u> 5.0X10<sup>-1</sup> </u>	<u> 1.4X10<sup>1</sup> </u>	<u> 5.0X10<sup>-1</sup> </u>	<u> 1.4X10<sup>1</sup> </u>	<u> 2.7X10<sup>3</sup> </u>	<u> 7.3X10<sup>4</sup> </u>
<u> Cs-137 (a) </u>	-	<u> 2.0 </u>	<u> 5.4X10<sup>1</sup> </u>	<u> 6.0X10<sup>-1</sup> </u>	<u> 1.6X10<sup>1</sup> </u>	<u> 3.2 </u>	<u> 8.7X10<sup>1</sup> </u>
<u> Cu-64 </u>	<u> Copper (29) </u>	<u> 6.0 </u>	<u> 1.6X10<sup>2</sup> </u>	<u> 1.0 </u>	<u> 2.7X10<sup>1</sup> </u>	<u> 1.4X10<sup>5</sup> </u>	<u> 3.9X10<sup>6</sup> </u>
<u> Cu-67 </u>	-	<u> 1.0X10<sup>1</sup> </u>	<u> 2.7X10<sup>2</sup> </u>	<u> 7.0X10<sup>-1</sup> </u>	<u> 1.9X10<sup>1</sup> </u>	<u> 2.8X10<sup>4</sup> </u>	<u> 7.6X10<sup>5</sup> </u>
<u> Dy-159 </u>	<u> Dysprosium (66) </u>	<u> 2.0X10<sup>1</sup> </u>	<u> 5.4X10<sup>2</sup> </u>	<u> 2.0X10<sup>1</sup> </u>	<u> 5.4X10<sup>2</sup> </u>	<u> 2.1X10<sup>2</sup> </u>	<u> 5.7X10<sup>3</sup> </u>
<u> Dy-165 </u>	-	<u> 9.0X10<sup>-1</sup> </u>	<u> 2.4X10<sup>1</sup> </u>	<u> 6.0X10<sup>-1</sup> </u>	<u> 1.6X10<sup>1</sup> </u>	<u> 3.0X10<sup>5</sup> </u>	<u> 8.2X10<sup>6</sup> </u>
<u> Dy-166 (a) </u>	-	<u> 9.0X10<sup>-1</sup> </u>	<u> 2.4X10<sup>1</sup> </u>	<u> 3.0X10<sup>-1</sup> </u>	<u> 8.1 </u>	<u> 8.6X10<sup>3</sup> </u>	<u> 2.3X10<sup>5</sup> </u>
<u> Er-169 </u>	<u> Erbium (68) </u>	<u> 4.0X10<sup>1</sup> </u>	<u> 1.1X10<sup>3</sup> </u>	<u> 1.0 </u>	<u> 2.7X10<sup>1</sup> </u>	<u> 3.1X10<sup>3</sup> </u>	<u> 8.3X10<sup>4</sup> </u>
<u> Er-171 </u>	-	<u> 8.0X10<sup>-1</sup> </u>	<u> 2.2X10<sup>1</sup> </u>	<u> 5.0X10<sup>-1</sup> </u>	<u> 1.4X10<sup>1</sup> </u>	<u> 9.0X10<sup>4</sup> </u>	<u> 2.4X10<sup>6</sup> </u>
<u> Eu-147 </u>	<u> Europium (63) </u>	<u> 2.0 </u>	<u> 5.4X10<sup>1</sup> </u>	<u> 2.0 </u>	<u> 5.4X10<sup>1</sup> </u>	<u> 1.4X10<sup>3</sup> </u>	<u> 3.7X10<sup>4</sup> </u>
<u> Eu-148 </u>	-	<u> 5.0X10<sup>-1</sup> </u>	<u> 1.4X10<sup>1</sup> </u>	<u> 5.0X10<sup>-1</sup> </u>	<u> 1.4X10<sup>1</sup> </u>	<u> 6.0X10<sup>2</sup> </u>	<u> 1.6X10<sup>4</sup> </u>
<u> Eu-149 </u>	-	<u> 2.0X10<sup>1</sup> </u>	<u> 5.4X10<sup>2</sup> </u>	<u> 2.0X10<sup>1</sup> </u>	<u> 5.4X10<sup>2</sup> </u>	<u> 3.5X10<sup>2</sup> </u>	<u> 9.4X10<sup>3</sup> </u>
<u> Eu-150 (short lived) </u>	-	<u> 2.0 </u>	<u> 5.4X10<sup>1</sup> </u>	<u> 7.0X10<sup>-1</sup> </u>	<u> 1.9X10<sup>1</sup> </u>	<u> 6.1X10<sup>4</sup> </u>	<u> 1.6X10<sup>6</sup> </u>
<u> Eu-150 (long lived) </u>	-	<u> 7.0X10<sup>-1</sup> </u>	<u> 1.9X10<sup>1</sup> </u>	<u> 7.0X10<sup>-1</sup> </u>	<u> 1.9X10<sup>1</sup> </u>	<u> 6.1X10<sup>4</sup> </u>	<u> 1.6X10<sup>6</sup> </u>
<u> Eu-152 </u>	-	<u> 1.0 </u>	<u> 2.7X10<sup>1</sup> </u>	<u> 1.0 </u>	<u> 2.7X10<sup>1</sup> </u>	<u> 6.5 </u>	<u> 1.8X10<sup>2</sup> </u>
<u> Eu-152m </u>	-	<u> 8.0X10<sup>-1</sup> </u>	<u> 2.2X10<sup>1</sup> </u>	<u> 8.0X10<sup>-1</sup> </u>	<u> 2.2X10<sup>1</sup> </u>	<u> 8.2X10<sup>4</sup> </u>	<u> 2.2X10<sup>6</sup> </u>
<u> Eu-154 </u>	-	<u> 9.0X10<sup>-1</sup> </u>	<u> 2.4X10<sup>1</sup> </u>	<u> 6.0X10<sup>-1</sup> </u>	<u> 1.6X10<sup>1</sup> </u>	<u> 9.8 </u>	<u> 2.6X10<sup>2</sup> </u>

<u>Eu-155</u>	-	<u>2.0X10<sup>1</sup></u>	<u>5.4X10<sup>2</sup></u>	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>1.8X10<sup>1</sup></u>	<u>4.9X10<sup>2</sup></u>
<u>Eu-156</u>	-	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>2.0X10<sup>3</sup></u>	<u>5.5X10<sup>4</sup></u>
<u>F-18</u>	<u>Fluorine (9)</u>	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>3.5X10<sup>6</sup></u>	<u>9.5X10<sup>7</sup></u>
<u>Fe-52 (a)</u>	<u>Iron (26)</u>	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>2.7X10<sup>5</sup></u>	<u>7.3X10<sup>6</sup></u>
<u>Fe-55</u>	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>8.8X10<sup>1</sup></u>	<u>2.4X10<sup>3</sup></u>
<u>Fe-59</u>	-	<u>9.0X10<sup>-1</sup></u>	<u>2.4X10<sup>1</sup></u>	<u>9.0X10<sup>-1</sup></u>	<u>2.4X10<sup>1</sup></u>	<u>1.8X10<sup>3</sup></u>	<u>5.0X10<sup>4</sup></u>
<u>Fe-60 (a)</u>	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>2.0X10<sup>-1</sup></u>	<u>5.4</u>	<u>7.4X10<sup>-4</sup></u>	<u>2.0X10<sup>-2</sup></u>
<u>Ga-67</u>	<u>Gallium (31)</u>	<u>7.0</u>	<u>1.9X10<sup>2</sup></u>	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>2.2X10<sup>4</sup></u>	<u>6.0X10<sup>5</sup></u>
<u>Ga-68</u>	-	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>1.5X10<sup>6</sup></u>	<u>4.1X10<sup>7</sup></u>
<u>Ga-72</u>	-	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>1.1X10<sup>5</sup></u>	<u>3.1X10<sup>6</sup></u>
<u>Gd-146 (a)</u>	<u>Gadolinium (64)</u>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>6.9X10<sup>2</sup></u>	<u>1.9X10<sup>4</sup></u>
<u>Gd-148</u>	-	<u>2.0X10<sup>1</sup></u>	<u>5.4X10<sup>2</sup></u>	<u>2.0X10<sup>-3</sup></u>	<u>5.4X10<sup>-2</sup></u>	<u>1.2</u>	<u>3.2X10<sup>1</sup></u>
<u>Gd-153</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>9.0</u>	<u>2.4X10<sup>2</sup></u>	<u>1.3X10<sup>2</sup></u>	<u>3.5X10<sup>3</sup></u>
<u>Gd-159</u>	-	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>3.9X10<sup>4</sup></u>	<u>1.1X10<sup>6</sup></u>
<u>Ge-68 (a)</u>	<u>Germanium (32)</u>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>2.6X10<sup>2</sup></u>	<u>7.1X10<sup>3</sup></u>
<u>Ge-71</u>	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>5.8X10<sup>3</sup></u>	<u>1.6X10<sup>5</sup></u>
<u>Ge-77</u>	-	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>1.3X10<sup>5</sup></u>	<u>3.6X10<sup>6</sup></u>
<u>Hf-172 (a)</u>	<u>Hafnium (72)</u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>4.1X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>
<u>Hf-175</u>	-	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>3.9X10<sup>2</sup></u>	<u>1.1X10<sup>4</sup></u>
<u>Hf-181</u>	-	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>6.3X10<sup>2</sup></u>	<u>1.7X10<sup>4</sup></u>
<u>Hf-182</u>	-	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>8.1X10<sup>-6</sup></u>	<u>2.2X10<sup>-4</sup></u>
<u>Hg-194 (a)</u>	<u>Mercury (80)</u>	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>1.3X10<sup>-1</sup></u>	<u>3.5</u>
<u>Hg-195m (a)</u>	-	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>1.5X10<sup>4</sup></u>	<u>4.0X10<sup>5</sup></u>
<u>Hg-197</u>	-	<u>2.0X10<sup>1</sup></u>	<u>5.4X10<sup>2</sup></u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>9.2X10<sup>3</sup></u>	<u>2.5X10<sup>5</sup></u>
<u>Hg-197m</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>2.5X10<sup>4</sup></u>	<u>6.7X10<sup>5</sup></u>
<u>Hg-203</u>	-	<u>5.0</u>	<u>1.4X10<sup>2</sup></u>	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>5.1X10<sup>2</sup></u>	<u>1.4X10<sup>4</sup></u>
<u>Ho-166</u>	<u>Holmium (67)</u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>2.6X10<sup>4</sup></u>	<u>7.0X10<sup>5</sup></u>
<u>Ho-166m</u>	-	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>6.6X10<sup>-2</sup></u>	<u>1.8</u>
<u>I-123</u>	<u>Iodine (53)</u>	<u>6.0</u>	<u>1.6X10<sup>2</sup></u>	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>7.1X10<sup>4</sup></u>	<u>1.9X10<sup>6</sup></u>
<u>I-124</u>	-	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>9.3X10<sup>3</sup></u>	<u>2.5X10<sup>5</sup></u>
<u>I-125</u>	-	<u>2.0X10<sup>1</sup></u>	<u>5.4X10<sup>2</sup></u>	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>6.4X10<sup>2</sup></u>	<u>1.7X10<sup>4</sup></u>
<u>I-126</u>	-	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>2.9X10<sup>3</sup></u>	<u>8.0X10<sup>4</sup></u>
<u>I-129</u>	-	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>6.5X10<sup>-6</sup></u>	<u>1.8X10<sup>-4</sup></u>

<u>I-131</u>	-	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>4.6X10<sup>3</sup></u>	<u>1.2X10<sup>5</sup></u>
<u>I-132</u>	-	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>3.8X10<sup>5</sup></u>	<u>1.0X10<sup>7</sup></u>
<u>I-133</u>	-	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>4.2X10<sup>4</sup></u>	<u>1.1X10<sup>6</sup></u>
<u>I-134</u>	-	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>9.9X10<sup>5</sup></u>	<u>2.7X10<sup>7</sup></u>
<u>I-135 (a)</u>	-	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>1.3X10<sup>5</sup></u>	<u>3.5X10<sup>6</sup></u>
<u>In-111</u>	<u>Indium (49)</u>	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>1.5X10<sup>4</sup></u>	<u>4.2X10<sup>5</sup></u>
<u>In-113m</u>	-	<u>4.0</u>	<u>1.1X10<sup>2</sup></u>	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>6.2X10<sup>5</sup></u>	<u>1.7X10<sup>7</sup></u>
<u>In-114m (a)</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>8.6X10<sup>2</sup></u>	<u>2.3X10<sup>4</sup></u>
<u>In-115m</u>	-	<u>7.0</u>	<u>1.9X10<sup>2</sup></u>	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>2.2X10<sup>5</sup></u>	<u>6.1X10<sup>6</sup></u>
<u>Ir-189 (a)</u>	<u>Iridium (77)</u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>1.9X10<sup>3</sup></u>	<u>5.2X10<sup>4</sup></u>
<u>Ir-190</u>	-	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>2.3X10<sup>3</sup></u>	<u>6.2X10<sup>4</sup></u>
<u>Ir-192 (c)</u>	-	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>3.4X10<sup>2</sup></u>	<u>9.2X10<sup>3</sup></u>
<u>Ir-194</u>	-	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>3.1X10<sup>4</sup></u>	<u>8.4X10<sup>5</sup></u>
<u>K-40</u>	<u>Potassium (19)</u>	<u>9.0X10<sup>-1</sup></u>	<u>2.4X10<sup>1</sup></u>	<u>9.0X10<sup>-1</sup></u>	<u>2.4X10<sup>1</sup></u>	<u>2.4X10<sup>-7</sup></u>	<u>6.4X10<sup>-6</sup></u>
<u>K-42</u>	-	<u>2.0X10<sup>-1</sup></u>	<u>5.4</u>	<u>2.0X10<sup>-1</sup></u>	<u>5.4</u>	<u>2.2X10<sup>5</sup></u>	<u>6.0X10<sup>6</sup></u>
<u>K-43</u>	-	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>1.2X10<sup>5</sup></u>	<u>3.3X10<sup>6</sup></u>
<u>Kr-81</u>	<u>Krypton (36)</u>	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>7.8X10<sup>-4</sup></u>	<u>2.1X10<sup>-2</sup></u>
<u>Kr-85</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>1.5X10<sup>1</sup></u>	<u>3.9X10<sup>2</sup></u>
<u>Kr-85m</u>	-	<u>8.0</u>	<u>2.2X10<sup>2</sup></u>	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>3.0X10<sup>5</sup></u>	<u>8.2X10<sup>6</sup></u>
<u>Kr-87</u>	-	<u>2.0X10<sup>-1</sup></u>	<u>5.4</u>	<u>2.0X10<sup>-1</sup></u>	<u>5.4</u>	<u>1.0X10<sup>6</sup></u>	<u>2.8X10<sup>7</sup></u>
<u>La-137</u>	<u>Lanthanum (57)</u>	<u>3.0X10<sup>1</sup></u>	<u>8.1X10<sup>2</sup></u>	<u>6.0</u>	<u>1.6X10<sup>2</sup></u>	<u>1.6X10<sup>-3</sup></u>	<u>4.4X10<sup>-2</sup></u>
<u>La-140</u>	-	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>2.1X10<sup>4</sup></u>	<u>5.6X10<sup>5</sup></u>
<u>Lu-172</u>	<u>Lutetium (71)</u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>4.2X10<sup>3</sup></u>	<u>1.1X10<sup>5</sup></u>
<u>Lu-173</u>	-	<u>8.0</u>	<u>2.2X10<sup>2</sup></u>	<u>8.0</u>	<u>2.2X10<sup>2</sup></u>	<u>5.6X10<sup>1</sup></u>	<u>1.5X10<sup>3</sup></u>
<u>Lu-174</u>	-	<u>9.0</u>	<u>2.4X10<sup>2</sup></u>	<u>9.0</u>	<u>2.4X10<sup>2</sup></u>	<u>2.3X10<sup>1</sup></u>	<u>6.2X10<sup>2</sup></u>
<u>Lu-174m</u>	-	<u>2.0X10<sup>1</sup></u>	<u>5.4X10<sup>2</sup></u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>2.0X10<sup>2</sup></u>	<u>5.3X10<sup>3</sup></u>
<u>Lu-177</u>	-	<u>3.0X10<sup>1</sup></u>	<u>8.1X10<sup>2</sup></u>	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>4.1X10<sup>3</sup></u>	<u>1.1X10<sup>5</sup></u>
<u>Mg-28 (a)</u>	<u>Magnesium (12)</u>	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>2.0X10<sup>5</sup></u>	<u>5.4X10<sup>6</sup></u>
<u>Mn-52</u>	<u>Manganese (25)</u>	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>1.6X10<sup>4</sup></u>	<u>4.4X10<sup>5</sup></u>
<u>Mn-53</u>	-	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>6.8X10<sup>-5</sup></u>	<u>1.8X10<sup>-3</sup></u>
<u>Mn-54</u>	-	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>2.9X10<sup>2</sup></u>	<u>7.7X10<sup>3</sup></u>
<u>Mn-56</u>	-	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>8.0X10<sup>5</sup></u>	<u>2.2X10<sup>7</sup></u>
<u>Mo-93</u>	<u>Molybdenum (42)</u>	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>2.0X10<sup>1</sup></u>	<u>5.4X10<sup>2</sup></u>	<u>4.1X10<sup>-2</sup></u>	<u>1.1</u>

Mo-99 (a) (i)	-	1.0	$2.7 \times 10^1$	$6.0 \times 10^{-1}$	$1.6 \times 10^1$	$1.8 \times 10^4$	$4.8 \times 10^5$
N-13	Nitrogen (7)	$9.0 \times 10^{-1}$	$2.4 \times 10^1$	$6.0 \times 10^{-1}$	$1.6 \times 10^1$	$5.4 \times 10^7$	$1.5 \times 10^9$
Na-22	Sodium (11)	$5.0 \times 10^{-1}$	$1.4 \times 10^1$	$5.0 \times 10^{-1}$	$1.4 \times 10^1$	$2.3 \times 10^2$	$6.3 \times 10^3$
Na-24	-	$2.0 \times 10^{-1}$	5.4	$2.0 \times 10^{-1}$	5.4	$3.2 \times 10^5$	$8.7 \times 10^6$
Nb-93m	Niobium (41)	$4.0 \times 10^1$	$1.1 \times 10^3$	$3.0 \times 10^1$	$8.1 \times 10^2$	8.8	$2.4 \times 10^2$
Nb-94	-	$7.0 \times 10^{-1}$	$1.9 \times 10^1$	$7.0 \times 10^{-1}$	$1.9 \times 10^1$	$6.9 \times 10^{-3}$	$1.9 \times 10^{-1}$
Nb-95	-	1.0	$2.7 \times 10^1$	1.0	$2.7 \times 10^1$	$1.5 \times 10^3$	$3.9 \times 10^4$
Nb-97	-	$9.0 \times 10^{-1}$	$2.4 \times 10^1$	$6.0 \times 10^{-1}$	$1.6 \times 10^1$	$9.9 \times 10^5$	$2.7 \times 10^7$
Nd-147	Neodymium (60)	6.0	$1.6 \times 10^2$	$6.0 \times 10^{-1}$	$1.6 \times 10^1$	$3.0 \times 10^3$	$8.1 \times 10^4$
Nd-149	-	$6.0 \times 10^{-1}$	$1.6 \times 10^1$	$5.0 \times 10^{-1}$	$1.4 \times 10^1$	$4.5 \times 10^5$	$1.2 \times 10^7$
Ni-59	Nickel (28)	Unlimited	Unlimited	Unlimited	Unlimited	$3.0 \times 10^{-3}$	$8.0 \times 10^{-2}$
Ni-63	-	$4.0 \times 10^1$	$1.1 \times 10^3$	$3.0 \times 10^1$	$8.1 \times 10^2$	2.1	$5.7 \times 10^1$
Ni-65	-	$4.0 \times 10^{-1}$	$1.1 \times 10^1$	$4.0 \times 10^{-1}$	$1.1 \times 10^1$	$7.1 \times 10^5$	$1.9 \times 10^7$
Np-235	Neptunium (93)	$4.0 \times 10^1$	$1.1 \times 10^3$	$4.0 \times 10^1$	$1.1 \times 10^3$	$5.2 \times 10^1$	$1.4 \times 10^3$
Np-236 (short-lived)	-	$2.0 \times 10^1$	$5.4 \times 10^2$	2.0	$5.4 \times 10^1$	$4.7 \times 10^{-4}$	$1.3 \times 10^{-2}$
Np-236 (long-lived)	-	$9.0 \times 10^0$	$2.4 \times 10^2$	$2.0 \times 10^{-2}$	$5.4 \times 10^{-1}$	$4.7 \times 10^{-4}$	$1.3 \times 10^{-2}$
Np-237	-	$2.0 \times 10^1$	$5.4 \times 10^2$	$2.0 \times 10^{-3}$	$5.4 \times 10^{-2}$	$2.6 \times 10^{-5}$	$7.1 \times 10^{-4}$
Np-239	-	7.0	$1.9 \times 10^2$	$4.0 \times 10^{-1}$	$1.1 \times 10^1$	$8.6 \times 10^3$	$2.3 \times 10^5$
Os-185	Osmium (76)	1.0	$2.7 \times 10^1$	1.0	$2.7 \times 10^1$	$2.8 \times 10^2$	$7.5 \times 10^3$
Os-191	-	$1.0 \times 10^1$	$2.7 \times 10^2$	2.0	$5.4 \times 10^1$	$1.6 \times 10^3$	$4.4 \times 10^4$
Os-191m	-	$4.0 \times 10^1$	$1.1 \times 10^3$	$3.0 \times 10^1$	$8.1 \times 10^2$	$4.6 \times 10^4$	$1.3 \times 10^6$
Os-193	-	2.0	$5.4 \times 10^1$	$6.0 \times 10^{-1}$	$1.6 \times 10^1$	$2.0 \times 10^4$	$5.3 \times 10^5$
Os-194 (a)	-	$3.0 \times 10^{-1}$	8.1	$3.0 \times 10^{-1}$	8.1	$1.1 \times 10^1$	$3.1 \times 10^2$
P-32	Phosphorus (15)	$5.0 \times 10^{-1}$	$1.4 \times 10^1$	$5.0 \times 10^{-1}$	$1.4 \times 10^1$	$1.1 \times 10^4$	$2.9 \times 10^5$
P-33	-	$4.0 \times 10^1$	$1.1 \times 10^3$	1.0	$2.7 \times 10^1$	$5.8 \times 10^3$	$1.6 \times 10^5$
Pa-230 (a)	Protactinium (91)	2.0	$5.4 \times 10^1$	$7.0 \times 10^{-2}$	1.9	$1.2 \times 10^3$	$3.3 \times 10^4$
Pa-231	-	4.0	$1.1 \times 10^2$	$4.0 \times 10^{-4}$	$1.1 \times 10^{-2}$	$1.7 \times 10^{-3}$	$4.7 \times 10^{-2}$
Pa-233	-	5.0	$1.4 \times 10^2$	$7.0 \times 10^{-1}$	$1.9 \times 10^1$	$7.7 \times 10^2$	$2.1 \times 10^4$
Pb-201	Lead (82)	1.0	$2.7 \times 10^1$	1.0	$2.7 \times 10^1$	$6.2 \times 10^4$	$1.7 \times 10^6$
Pb-202	-	$4.0 \times 10^1$	$1.1 \times 10^3$	$2.0 \times 10^1$	$5.4 \times 10^2$	$1.2 \times 10^{-4}$	$3.4 \times 10^{-3}$
Pb-203	-	4.0	$1.1 \times 10^2$	3.0	$8.1 \times 10^1$	$1.1 \times 10^4$	$3.0 \times 10^5$
Pb-205	-	Unlimited	Unlimited	Unlimited	Unlimited	$4.5 \times 10^{-6}$	$1.2 \times 10^{-4}$

<a href="#">Pb-210 (a)</a>	-	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>5.0X10<sup>-2</sup></u>	<u>1.4</u>	<u>2.8</u>	<u>7.6X10<sup>1</sup></u>
<a href="#">Pb-212 (a)</a>	-	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>2.0X10<sup>-1</sup></u>	<u>5.4</u>	<u>5.1X10<sup>4</sup></u>	<u>1.4X10<sup>6</sup></u>
<a href="#">Pd-103 (a)</a>	<a href="#">Palladium (46)</a>	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>2.8X10<sup>3</sup></u>	<u>7.5X10<sup>4</sup></u>
<a href="#">Pd-107</a>	-	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>1.9X10<sup>-5</sup></u>	<u>5.1X10<sup>-4</sup></u>
<a href="#">Pd-109</a>	-	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>7.9X10<sup>4</sup></u>	<u>2.1X10<sup>6</sup></u>
<a href="#">Pm-143</a>	<a href="#">Promethium (61)</a>	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>1.3X10<sup>2</sup></u>	<u>3.4X10<sup>3</sup></u>
<a href="#">Pm-144</a>	-	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>9.2X10<sup>1</sup></u>	<u>2.5X10<sup>3</sup></u>
<a href="#">Pm-145</a>	-	<u>3.0X10<sup>1</sup></u>	<u>8.1X10<sup>2</sup></u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>5.2</u>	<u>1.4X10<sup>2</sup></u>
<a href="#">Pm-147</a>	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>3.4X10<sup>1</sup></u>	<u>9.3X10<sup>2</sup></u>
<a href="#">Pm-148m (a)</a>	-	<u>8.0X10<sup>-1</sup></u>	<u>2.2X10<sup>1</sup></u>	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>7.9X10<sup>2</sup></u>	<u>2.1X10<sup>4</sup></u>
<a href="#">Pm-149</a>	-	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>1.5X10<sup>4</sup></u>	<u>4.0X10<sup>5</sup></u>
<a href="#">Pm-151</a>	-	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>2.7X10<sup>4</sup></u>	<u>7.3X10<sup>5</sup></u>
<a href="#">Po-210</a>	<a href="#">Polonium (84)</a>	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>2.0X10<sup>-2</sup></u>	<u>5.4X10<sup>-1</sup></u>	<u>1.7X10<sup>2</sup></u>	<u>4.5X10<sup>3</sup></u>
<a href="#">Pr-142</a>	<a href="#">Praseodymium (59)</a>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>4.3X10<sup>4</sup></u>	<u>1.2X10<sup>6</sup></u>
<a href="#">Pr-143</a>	-	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>2.5X10<sup>3</sup></u>	<u>6.7X10<sup>4</sup></u>
<a href="#">Pt-188 (a)</a>	<a href="#">Platinum (78)</a>	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>8.0X10<sup>-1</sup></u>	<u>2.2X10<sup>1</sup></u>	<u>2.5X10<sup>3</sup></u>	<u>6.8X10<sup>4</sup></u>
<a href="#">Pt-191</a>	-	<u>4.0</u>	<u>1.1X10<sup>2</sup></u>	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>8.7X10<sup>3</sup></u>	<u>2.4X10<sup>5</sup></u>
<a href="#">Pt-193</a>	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>1.4</u>	<u>3.7X10<sup>1</sup></u>
<a href="#">Pt-193m</a>	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>5.8X10<sup>3</sup></u>	<u>1.6X10<sup>5</sup></u>
<a href="#">Pt-195m</a>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>6.2X10<sup>3</sup></u>	<u>1.7X10<sup>5</sup></u>
<a href="#">Pt-197</a>	-	<u>2.0X10<sup>1</sup></u>	<u>5.4X10<sup>2</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>3.2X10<sup>4</sup></u>	<u>8.7X10<sup>5</sup></u>
<a href="#">Pt-197m</a>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>3.7X10<sup>5</sup></u>	<u>1.0X10<sup>7</sup></u>
<a href="#">Pu-236</a>	<a href="#">Plutonium (94)</a>	<u>3.0X10<sup>1</sup></u>	<u>8.1X10<sup>2</sup></u>	<u>3.0X10<sup>-3</sup></u>	<u>8.1X10<sup>-2</sup></u>	<u>2.0X10<sup>1</sup></u>	<u>5.3X10<sup>2</sup></u>
<a href="#">Pu-237</a>	-	<u>2.0X10<sup>1</sup></u>	<u>5.4X10<sup>2</sup></u>	<u>2.0X10<sup>1</sup></u>	<u>5.4X10<sup>2</sup></u>	<u>4.5X10<sup>2</sup></u>	<u>1.2X10<sup>4</sup></u>
<a href="#">Pu-238</a>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>1.0X10<sup>-3</sup></u>	<u>2.7X10<sup>-2</sup></u>	<u>6.3X10<sup>-1</sup></u>	<u>1.7X10<sup>1</sup></u>
<a href="#">Pu-239</a>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>1.0X10<sup>-3</sup></u>	<u>2.7X10<sup>-2</sup></u>	<u>2.3X10<sup>-3</sup></u>	<u>6.2X10<sup>-2</sup></u>
<a href="#">Pu-240</a>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>1.0X10<sup>-3</sup></u>	<u>2.7X10<sup>-2</sup></u>	<u>8.4X10<sup>-3</sup></u>	<u>2.3X10<sup>-1</sup></u>
<a href="#">Pu-241 (a)</a>	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>6.0X10<sup>-2</sup></u>	<u>1.6</u>	<u>3.8</u>	<u>1.0X10<sup>2</sup></u>
<a href="#">Pu-242</a>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>1.0X10<sup>-3</sup></u>	<u>2.7X10<sup>-2</sup></u>	<u>1.5X10<sup>-4</sup></u>	<u>3.9X10<sup>-3</sup></u>
<a href="#">Pu-244 (a)</a>	-	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>1.0X10<sup>-3</sup></u>	<u>2.7X10<sup>-2</sup></u>	<u>6.7X10<sup>-7</sup></u>	<u>1.8X10<sup>-5</sup></u>
<a href="#">Ra-223 (a)</a>	<a href="#">Radium (88)</a>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>7.0X10<sup>-3</sup></u>	<u>1.9X10<sup>-1</sup></u>	<u>1.9X10<sup>3</sup></u>	<u>5.1X10<sup>4</sup></u>
<a href="#">Ra-224 (a)</a>	-	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>2.0X10<sup>-2</sup></u>	<u>5.4X10<sup>-1</sup></u>	<u>5.9X10<sup>3</sup></u>	<u>1.6X10<sup>5</sup></u>
<a href="#">Ra-225 (a)</a>	-	<u>2.0X10<sup>-1</sup></u>	<u>5.4</u>	<u>4.0X10<sup>-3</sup></u>	<u>1.1X10<sup>-1</sup></u>	<u>1.5X10<sup>3</sup></u>	<u>3.9X10<sup>4</sup></u>

<a href="#">Ra-226 (a)</a>	-	<u>2.0X10<sup>-1</sup></u>	<u>5.4</u>	<u>3.0X10<sup>-3</sup></u>	<u>8.1X10<sup>-2</sup></u>	<u>3.7X10<sup>-2</sup></u>	<u>1.0</u>
<a href="#">Ra-228 (a)</a>	-	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>2.0X10<sup>-2</sup></u>	<u>5.4X10<sup>-1</sup></u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>
<a href="#">Rb-81</a>	<a href="#">Rubidium (37)</a>	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>8.0X10<sup>-1</sup></u>	<u>2.2X10<sup>1</sup></u>	<u>3.1X10<sup>5</sup></u>	<u>8.4X10<sup>6</sup></u>
<a href="#">Rb-83 (a)</a>	-	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>6.8X10<sup>2</sup></u>	<u>1.8X10<sup>4</sup></u>
<a href="#">Rb-84</a>	-	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>1.8X10<sup>3</sup></u>	<u>4.7X10<sup>4</sup></u>
<a href="#">Rb-86</a>	-	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>3.0X10<sup>3</sup></u>	<u>8.1X10<sup>4</sup></u>
<a href="#">Rb-87</a>	-	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>3.2X10<sup>-9</sup></u>	<u>8.6X10<sup>-8</sup></u>
<a href="#">Rb(nat)</a>	-	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>6.7X10<sup>6</sup></u>	<u>1.8X10<sup>8</sup></u>
<a href="#">Re-184</a>	<a href="#">Rhenium (75)</a>	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>6.9X10<sup>2</sup></u>	<u>1.9X10<sup>4</sup></u>
<a href="#">Re-184m</a>	-	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>1.6X10<sup>2</sup></u>	<u>4.3X10<sup>3</sup></u>
<a href="#">Re-186</a>	-	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>6.9X10<sup>3</sup></u>	<u>1.9X10<sup>5</sup></u>
<a href="#">Re-187</a>	-	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>1.4X10<sup>-9</sup></u>	<u>3.8X10<sup>-8</sup></u>
<a href="#">Re-188</a>	-	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>3.6X10<sup>4</sup></u>	<u>9.8X10<sup>5</sup></u>
<a href="#">Re-189 (a)</a>	-	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>2.5X10<sup>4</sup></u>	<u>6.8X10<sup>5</sup></u>
<a href="#">Re(nat)</a>	-	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>0.0</u>	<u>2.4X10<sup>-8</sup></u>
<a href="#">Rh-99</a>	<a href="#">Rhodium (45)</a>	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>3.0X10<sup>3</sup></u>	<u>8.2X10<sup>4</sup></u>
<a href="#">Rh-101</a>	-	<u>4.0</u>	<u>1.1X10<sup>2</sup></u>	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>4.1X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>
<a href="#">Rh-102</a>	-	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>4.5X10<sup>1</sup></u>	<u>1.2X10<sup>3</sup></u>
<a href="#">Rh-102m</a>	-	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>2.3X10<sup>2</sup></u>	<u>6.2X10<sup>3</sup></u>
<a href="#">Rh-103m</a>	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>1.2X10<sup>6</sup></u>	<u>3.3X10<sup>7</sup></u>
<a href="#">Rh-105</a>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>8.0X10<sup>-1</sup></u>	<u>2.2X10<sup>1</sup></u>	<u>3.1X10<sup>4</sup></u>	<u>8.4X10<sup>5</sup></u>
<a href="#">Rn-222 (a)</a>	<a href="#">Radon (86)</a>	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>4.0X10<sup>-3</sup></u>	<u>1.1X10<sup>-1</sup></u>	<u>5.7X10<sup>3</sup></u>	<u>1.5X10<sup>5</sup></u>
<a href="#">Ru-97</a>	<a href="#">Ruthenium (44)</a>	<u>5.0</u>	<u>1.4X10<sup>2</sup></u>	<u>5.0</u>	<u>1.4X10<sup>2</sup></u>	<u>1.7X10<sup>4</sup></u>	<u>4.6X10<sup>5</sup></u>
<a href="#">Ru-103 (a)</a>	-	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>1.2X10<sup>3</sup></u>	<u>3.2X10<sup>4</sup></u>
<a href="#">Ru-105</a>	-	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>2.5X10<sup>5</sup></u>	<u>6.7X10<sup>6</sup></u>
<a href="#">Ru-106 (a)</a>	-	<u>2.0X10<sup>-1</sup></u>	<u>5.4</u>	<u>2.0X10<sup>-1</sup></u>	<u>5.4</u>	<u>1.2X10<sup>2</sup></u>	<u>3.3X10<sup>3</sup></u>
<a href="#">S-35</a>	<a href="#">Sulphur (16)</a>	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>1.6X10<sup>3</sup></u>	<u>4.3X10<sup>4</sup></u>
<a href="#">Sb-122</a>	<a href="#">Antimony (51)</a>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>1.5X10<sup>4</sup></u>	<u>4.0X10<sup>5</sup></u>
<a href="#">Sb-124</a>	-	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>6.5X10<sup>2</sup></u>	<u>1.7X10<sup>4</sup></u>
<a href="#">Sb-125</a>	-	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>3.9X10<sup>1</sup></u>	<u>1.0X10<sup>3</sup></u>
<a href="#">Sb-126</a>	-	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>3.1X10<sup>3</sup></u>	<u>8.4X10<sup>4</sup></u>
<a href="#">Sc-44</a>	<a href="#">Scandium (21)</a>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>6.7X10<sup>5</sup></u>	<u>1.8X10<sup>7</sup></u>
<a href="#">Sc-46</a>	-	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>1.3X10<sup>3</sup></u>	<u>3.4X10<sup>4</sup></u>

<u>Sc-47</u>	-	<u>1.0X10<sup>-1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>3.1X10<sup>4</sup></u>	<u>8.3X10<sup>5</sup></u>
<u>Sc-48</u>	-	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>5.5X10<sup>4</sup></u>	<u>1.5X10<sup>6</sup></u>
<u>Se-75</u>	<u>Selenium (34)</u>	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>5.4X10<sup>2</sup></u>	<u>1.5X10<sup>4</sup></u>
<u>Se-79</u>	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>2.6X10<sup>-3</sup></u>	<u>7.0X10<sup>-2</sup></u>
<u>Si-31</u>	<u>Silicon (14)</u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>1.4X10<sup>6</sup></u>	<u>3.9X10<sup>7</sup></u>
<u>Si-32</u>	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>3.9</u>	<u>1.1X10<sup>2</sup></u>
<u>Sm-145</u>	<u>Samarium (62)</u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>9.8X10<sup>1</sup></u>	<u>2.6X10<sup>3</sup></u>
<u>Sm-147</u>	-	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>8.5X10<sup>-1</sup></u>	<u>2.3X10<sup>-8</sup></u>
<u>Sm-151</u>	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>9.7X10<sup>-1</sup></u>	<u>2.6X10<sup>1</sup></u>
<u>Sm-153</u>	-	<u>9.0</u>	<u>2.4X10<sup>2</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>1.6X10<sup>4</sup></u>	<u>4.4X10<sup>5</sup></u>
<u>Sn-113 (a)</u>	<u>Tin (50)</u>	<u>4.0</u>	<u>1.1X10<sup>2</sup></u>	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>3.7X10<sup>2</sup></u>	<u>1.0X10<sup>4</sup></u>
<u>Sn-117m</u>	-	<u>7.0</u>	<u>1.9X10<sup>2</sup></u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>3.0X10<sup>3</sup></u>	<u>8.2X10<sup>4</sup></u>
<u>Sn-119m</u>	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>3.0X10<sup>1</sup></u>	<u>8.1X10<sup>2</sup></u>	<u>1.4X10<sup>2</sup></u>	<u>3.7X10<sup>3</sup></u>
<u>Sn-121m (a)</u>	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>9.0X10<sup>-1</sup></u>	<u>2.4X10<sup>1</sup></u>	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>
<u>Sn-123</u>	-	<u>8.0X10<sup>-1</sup></u>	<u>2.2X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>3.0X10<sup>2</sup></u>	<u>8.2X10<sup>3</sup></u>
<u>Sn-125</u>	-	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>4.0X10<sup>3</sup></u>	<u>1.1X10<sup>5</sup></u>
<u>Sn-126 (a)</u>	-	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>1.0X10<sup>-3</sup></u>	<u>2.8X10<sup>-2</sup></u>
<u>Sr-82 (a)</u>	<u>Strontium (38)</u>	<u>2.0X10<sup>-1</sup></u>	<u>5.4</u>	<u>2.0X10<sup>-1</sup></u>	<u>5.4</u>	<u>2.3X10<sup>3</sup></u>	<u>6.2X10<sup>4</sup></u>
<u>Sr-85</u>	-	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>8.8X10<sup>2</sup></u>	<u>2.4X10<sup>4</sup></u>
<u>Sr-85m</u>	-	<u>5.0</u>	<u>1.4X10<sup>2</sup></u>	<u>5.0</u>	<u>1.4X10<sup>2</sup></u>	<u>1.2X10<sup>6</sup></u>	<u>3.3X10<sup>7</sup></u>
<u>Sr-87m</u>	-	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>4.8X10<sup>5</sup></u>	<u>1.3X10<sup>7</sup></u>
<u>Sr-89</u>	-	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>2.9X10<sup>4</sup></u>
<u>Sr-90 (a)</u>	-	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>5.1</u>	<u>1.4X10<sup>2</sup></u>
<u>Sr-91 (a)</u>	-	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>1.3X10<sup>5</sup></u>	<u>3.6X10<sup>6</sup></u>
<u>Sr-92 (a)</u>	-	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>4.7X10<sup>5</sup></u>	<u>1.3X10<sup>7</sup></u>
<u>T(H-3)</u>	<u>Tritium (1)</u>	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>3.6X10<sup>2</sup></u>	<u>9.7X10<sup>3</sup></u>
<u>Ta-178 (long-lived)</u>	<u>Tantalum (73)</u>	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>8.0X10<sup>-1</sup></u>	<u>2.2X10<sup>1</sup></u>	<u>4.2X10<sup>6</sup></u>	<u>1.1X10<sup>8</sup></u>
<u>Ta-179</u>	-	<u>3.0X10<sup>1</sup></u>	<u>8.1X10<sup>2</sup></u>	<u>3.0X10<sup>1</sup></u>	<u>8.1X10<sup>2</sup></u>	<u>4.1X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>
<u>Ta-182</u>	-	<u>9.0X10<sup>-1</sup></u>	<u>2.4X10<sup>1</sup></u>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>2.3X10<sup>2</sup></u>	<u>6.2X10<sup>3</sup></u>
<u>Tb-157</u>	<u>Terbium (65)</u>	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>5.6X10<sup>-1</sup></u>	<u>1.5X10<sup>1</sup></u>
<u>Tb-158</u>	-	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>5.6X10<sup>-1</sup></u>	<u>1.5X10<sup>1</sup></u>
<u>Tb-160</u>	-	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>4.2X10<sup>2</sup></u>	<u>1.1X10<sup>4</sup></u>

<a href="#">Tc-95m (a)</a>	<a href="#">Technetium (43)</a>	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>8.3X10<sup>2</sup></u>	<u>2.2X10<sup>4</sup></u>
<a href="#">Tc-96</a>	-	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>1.2X10<sup>4</sup></u>	<u>3.2X10<sup>5</sup></u>
<a href="#">Tc-96m (a)</a>	-	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>1.4X10<sup>6</sup></u>	<u>3.8X10<sup>7</sup></u>
<a href="#">Tc-97</a>	-	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>5.2X10<sup>-5</sup></u>	<u>1.4X10<sup>-3</sup></u>
<a href="#">Tc-97m</a>	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>5.6X10<sup>2</sup></u>	<u>1.5X10<sup>4</sup></u>
<a href="#">Tc-98</a>	-	<u>8.0X10<sup>-1</sup></u>	<u>2.2X10<sup>1</sup></u>	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>3.2X10<sup>-5</sup></u>	<u>8.7X10<sup>-4</sup></u>
<a href="#">Tc-99</a>	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>9.0X10<sup>-1</sup></u>	<u>2.4X10<sup>1</sup></u>	<u>6.3X10<sup>-4</sup></u>	<u>1.7X10<sup>-2</sup></u>
<a href="#">Tc-99m</a>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>4.0</u>	<u>1.1X10<sup>2</sup></u>	<u>1.9X10<sup>5</sup></u>	<u>5.3X10<sup>6</sup></u>
<a href="#">Te-121</a>	<a href="#">Tellurium (52)</a>	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>2.4X10<sup>3</sup></u>	<u>6.4X10<sup>4</sup></u>
<a href="#">Te-121m</a>	-	<u>5.0</u>	<u>1.4X10<sup>2</sup></u>	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>2.6X10<sup>2</sup></u>	<u>7.0X10<sup>3</sup></u>
<a href="#">Te-123m</a>	-	<u>8.0</u>	<u>2.2X10<sup>2</sup></u>	<u>1.0</u>	<u>2.7X10<sup>1</sup></u>	<u>3.3X10<sup>2</sup></u>	<u>8.9X10<sup>3</sup></u>
<a href="#">Te-125m</a>	-	<u>2.0X10<sup>1</sup></u>	<u>5.4X10<sup>2</sup></u>	<u>9.0X10<sup>-1</sup></u>	<u>2.4X10<sup>1</sup></u>	<u>6.7X10<sup>2</sup></u>	<u>1.8X10<sup>4</sup></u>
<a href="#">Te-127</a>	-	<u>2.0X10<sup>1</sup></u>	<u>5.4X10<sup>2</sup></u>	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>9.8X10<sup>4</sup></u>	<u>2.6X10<sup>6</sup></u>
<a href="#">Te-127m (a)</a>	-	<u>2.0X10<sup>1</sup></u>	<u>5.4X10<sup>2</sup></u>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>3.5X10<sup>2</sup></u>	<u>9.4X10<sup>3</sup></u>
<a href="#">Te-129</a>	-	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>7.7X10<sup>5</sup></u>	<u>2.1X10<sup>7</sup></u>
<a href="#">Te-129m (a)</a>	-	<u>8.0X10<sup>-1</sup></u>	<u>2.2X10<sup>1</sup></u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>3.0X10<sup>4</sup></u>
<a href="#">Te-131m (a)</a>	-	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>3.0X10<sup>4</sup></u>	<u>8.0X10<sup>5</sup></u>
<a href="#">Te-132 (a)</a>	-	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>3.1X10<sup>4</sup></u>	<u>3.0X10<sup>5</sup></u>
<a href="#">Th-227</a>	<a href="#">Thorium (90)</a>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>5.0X10<sup>-3</sup></u>	<u>1.4X10<sup>-1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>3.1X10<sup>4</sup></u>
<a href="#">Th-228 (a)</a>	-	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>1.0X10<sup>-3</sup></u>	<u>2.7X10<sup>-2</sup></u>	<u>3.0X10<sup>1</sup></u>	<u>8.2X10<sup>2</sup></u>
<a href="#">Th-229</a>	-	<u>5.0</u>	<u>1.4X10<sup>2</sup></u>	<u>5.0X10<sup>-4</sup></u>	<u>1.4X10<sup>-2</sup></u>	<u>7.9X10<sup>-3</sup></u>	<u>2.1X10<sup>-1</sup></u>
<a href="#">Th-230</a>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>1.0X10<sup>-3</sup></u>	<u>2.7X10<sup>-2</sup></u>	<u>7.6X10<sup>-4</sup></u>	<u>2.1X10<sup>-2</sup></u>
<a href="#">Th-231</a>	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>2.0X10<sup>-2</sup></u>	<u>5.4X10<sup>-1</sup></u>	<u>2.0X10<sup>4</sup></u>	<u>5.3X10<sup>5</sup></u>
<a href="#">Th-232</a>	-	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>4.0X10<sup>-9</sup></u>	<u>1.1X10<sup>-7</sup></u>
<a href="#">Th-234 (a)</a>	-	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>3.0X10<sup>-1</sup></u>	<u>8.1</u>	<u>8.6X10<sup>2</sup></u>	<u>2.3X10<sup>4</sup></u>
<a href="#">Th(nat)</a>	-	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>8.1X10<sup>-9</sup></u>	<u>2.2X10<sup>-7</sup></u>
<a href="#">Ti-44 (a)</a>	<a href="#">Titanium (22)</a>	<u>5.0X10<sup>-1</sup></u>	<u>1.4X10<sup>1</sup></u>	<u>4.0X10<sup>-1</sup></u>	<u>1.1X10<sup>1</sup></u>	<u>6.4</u>	<u>1.7X10<sup>2</sup></u>
<a href="#">Tl-200</a>	<a href="#">Thallium (81)</a>	<u>9.0X10<sup>-1</sup></u>	<u>2.4X10<sup>1</sup></u>	<u>9.0X10<sup>-1</sup></u>	<u>2.4X10<sup>1</sup></u>	<u>2.2X10<sup>4</sup></u>	<u>6.0X10<sup>5</sup></u>
<a href="#">Tl-201</a>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>4.0</u>	<u>1.1X10<sup>2</sup></u>	<u>7.9X10<sup>3</sup></u>	<u>2.1X10<sup>5</sup></u>
<a href="#">Tl-202</a>	-	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>2.0</u>	<u>5.4X10<sup>1</sup></u>	<u>2.0X10<sup>3</sup></u>	<u>5.3X10<sup>4</sup></u>
<a href="#">Tl-204</a>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>7.0X10<sup>-1</sup></u>	<u>1.9X10<sup>1</sup></u>	<u>1.7X10<sup>1</sup></u>	<u>4.6X10<sup>2</sup></u>
<a href="#">Tm-167</a>	<a href="#">Thulium (69)</a>	<u>7.0</u>	<u>1.9X10<sup>2</sup></u>	<u>8.0X10<sup>-1</sup></u>	<u>2.2X10<sup>1</sup></u>	<u>3.1X10<sup>3</sup></u>	<u>8.5X10<sup>4</sup></u>
<a href="#">Tm-170</a>	-	<u>3.0</u>	<u>8.1X10<sup>1</sup></u>	<u>6.0X10<sup>-1</sup></u>	<u>1.6X10<sup>1</sup></u>	<u>2.2X10<sup>2</sup></u>	<u>6.0X10<sup>3</sup></u>

Tm-171	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>
U-230 (fast lung absorption) (a)(d)	Uranium (92)	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>1.0X10<sup>-1</sup></u>	<u>2.7</u>	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>4</sup></u>
U-230 (medium lung absorption) (a)(e)	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>4.0X10<sup>-3</sup></u>	<u>1.1X10<sup>-1</sup></u>	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>4</sup></u>
U-230 (slow lung absorption) (a)(f)	-	<u>3.0X10<sup>1</sup></u>	<u>8.1X10<sup>2</sup></u>	<u>3.0X10<sup>-3</sup></u>	<u>8.1X10<sup>-2</sup></u>	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>4</sup></u>
U-232 (fast lung absorption) (d)	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>1.0X10<sup>-2</sup></u>	<u>2.7X10<sup>-1</sup></u>	<u>8.3X10<sup>-1</sup></u>	<u>2.2X10<sup>1</sup></u>
U-232 (medium lung absorption) (e)	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>7.0X10<sup>-3</sup></u>	<u>1.9X10<sup>-1</sup></u>	<u>8.3X10<sup>-1</sup></u>	<u>2.2X10<sup>1</sup></u>
U-232 (slow lung absorption) (f)	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>2</sup></u>	<u>1.0X10<sup>-3</sup></u>	<u>2.7X10<sup>-2</sup></u>	<u>8.3X10<sup>-1</sup></u>	<u>2.2X10<sup>1</sup></u>
U-233 (fast lung absorption) (d)	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>9.0X10<sup>-2</sup></u>	<u>2.4</u>	<u>3.6X10<sup>-4</sup></u>	<u>9.7X10<sup>-3</sup></u>
U-233 (medium lung absorption) (e)	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>2.0X10<sup>-2</sup></u>	<u>5.4X10<sup>-1</sup></u>	<u>3.6X10<sup>-4</sup></u>	<u>9.7X10<sup>-3</sup></u>
U-233 (slow lung absorption) (f)	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>6.0X10<sup>-3</sup></u>	<u>1.6X10<sup>-1</sup></u>	<u>3.6X10<sup>-4</sup></u>	<u>9.7X10<sup>-3</sup></u>
U-234 (fast lung absorption) (d)	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>9.0X10<sup>-2</sup></u>	<u>2.4</u>	<u>2.3X10<sup>-4</sup></u>	<u>6.2X10<sup>-3</sup></u>
U-234 (medium lung absorption) (e)	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>2.0X10<sup>-2</sup></u>	<u>5.4X10<sup>-1</sup></u>	<u>2.3X10<sup>-4</sup></u>	<u>6.2X10<sup>-3</sup></u>
U-234 (slow lung absorption) (f)	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>6.0X10<sup>-3</sup></u>	<u>1.6X10<sup>-1</sup></u>	<u>2.3X10<sup>-4</sup></u>	<u>6.2X10<sup>-3</sup></u>
U-235 (all lung absorption types) (a),(d),(e),(f)	-	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>8.0X10<sup>-8</sup></u>	<u>2.2X10<sup>-6</sup></u>
U-236 (fast lung absorption) (d)	-	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>2.4X10<sup>-6</sup></u>	<u>6.5X10<sup>-5</sup></u>
U-236 (medium lung absorption) (e)	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>2.0X10<sup>-2</sup></u>	<u>5.4X10<sup>-1</sup></u>	<u>2.4X10<sup>-6</sup></u>	<u>6.5X10<sup>-5</sup></u>
U-236 (slow lung absorption) (f)	-	<u>4.0X10<sup>1</sup></u>	<u>1.1X10<sup>3</sup></u>	<u>6.0X10<sup>-3</sup></u>	<u>1.6X10<sup>-1</sup></u>	<u>2.4X10<sup>-6</sup></u>	<u>6.5X10<sup>-5</sup></u>
U-238 (all lung absorption types) (d),(e),(f)	-	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>1.2X10<sup>-8</sup></u>	<u>3.4X10<sup>-7</sup></u>
U (nat)	-	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>2.6X10<sup>-8</sup></u>	<u>7.1X10<sup>-7</sup></u>
U (enriched to	-	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	<u>Unlimited</u>	See Table A-4	See Table A-4

20% or less) (g)							
U (dep)	-	Unlimited	Unlimited	Unlimited	Unlimited	See Table A-4	(See Table A-3)
V-48	Vanadium (23)	$4.0 \times 10^{-1}$	$1.1 \times 10^1$	$4.0 \times 10^{-1}$	$1.1 \times 10^1$	$6.3 \times 10^3$	$1.7 \times 10^5$
V-49	-	$4.0 \times 10^1$	$1.1 \times 10^3$	$4.0 \times 10^1$	$1.1 \times 10^3$	$3.0 \times 10^2$	$8.1 \times 10^3$
W-178 (a)	Tungsten (74)	9.0	$2.4 \times 10^2$	5.0	$1.4 \times 10^2$	$1.3 \times 10^3$	$3.4 \times 10^4$
W-181	-	$3.0 \times 10^1$	$8.1 \times 10^2$	$3.0 \times 10^1$	$8.1 \times 10^2$	$2.2 \times 10^2$	$6.0 \times 10^3$
W-185	-	$4.0 \times 10^1$	$1.1 \times 10^3$	$8.0 \times 10^{-1}$	$2.2 \times 10^1$	$3.5 \times 10^2$	$9.4 \times 10^3$
W-187	-	2.0	$5.4 \times 10^1$	$6.0 \times 10^{-1}$	$1.6 \times 10^1$	$2.6 \times 10^4$	$7.0 \times 10^5$
W-188 (a)	-	$4.0 \times 10^{-1}$	$1.1 \times 10^1$	$3.0 \times 10^{-1}$	8.1	$3.7 \times 10^2$	$1.0 \times 10^4$
Xe-122 (a)	Xenon (54)	$4.0 \times 10^{-1}$	$1.1 \times 10^1$	$4.0 \times 10^{-1}$	$1.1 \times 10^1$	$4.8 \times 10^4$	$1.3 \times 10^6$
Xe-123	-	2.0	$5.4 \times 10^1$	$7.0 \times 10^{-1}$	$1.9 \times 10^1$	$4.4 \times 10^5$	$1.2 \times 10^7$
Xe-127	-	4.0	$1.1 \times 10^2$	2.0	$5.4 \times 10^1$	$1.0 \times 10^3$	$2.8 \times 10^4$
Xe-131m	-	$4.0 \times 10^1$	$1.1 \times 10^3$	$4.0 \times 10^1$	$1.1 \times 10^3$	$3.1 \times 10^3$	$8.4 \times 10^4$
Xe-133	-	$2.0 \times 10^1$	$5.4 \times 10^2$	$1.0 \times 10^1$	$2.7 \times 10^2$	$6.9 \times 10^3$	$1.9 \times 10^5$
Xe-135	-	3.0	$8.1 \times 10^1$	2.0	$5.4 \times 10^1$	$9.5 \times 10^4$	$2.6 \times 10^6$
Y-87 (a)	Yttrium (39)	1.0	$2.7 \times 10^1$	1.0	$2.7 \times 10^1$	$1.7 \times 10^4$	$4.5 \times 10^5$
Y-88	-	$4.0 \times 10^{-1}$	$1.1 \times 10^1$	$4.0 \times 10^{-1}$	$1.1 \times 10^1$	$5.2 \times 10^2$	$1.4 \times 10^4$
Y-90	-	$3.0 \times 10^{-1}$	8.1	$3.0 \times 10^{-1}$	8.1	$2.0 \times 10^4$	$5.4 \times 10^5$
Y-91	-	$6.0 \times 10^{-1}$	$1.6 \times 10^1$	$6.0 \times 10^{-1}$	$1.6 \times 10^1$	$9.1 \times 10^2$	$2.5 \times 10^4$
Y-91m	-	2.0	$5.4 \times 10^1$	2.0	$5.4 \times 10^1$	$1.5 \times 10^6$	$4.2 \times 10^7$
Y-92	-	$2.0 \times 10^{-1}$	5.4	$2.0 \times 10^{-1}$	5.4	$3.6 \times 10^5$	$9.6 \times 10^6$
Y-93	-	$3.0 \times 10^{-1}$	8.1	$3.0 \times 10^{-1}$	8.1	$1.2 \times 10^5$	$3.3 \times 10^6$
Yb-169	Ytterbium (70)	4.0	$1.1 \times 10^2$	1.0	$2.7 \times 10^1$	$8.9 \times 10^2$	$2.4 \times 10^4$
Yb-175	-	$3.0 \times 10^1$	$8.1 \times 10^2$	$9.0 \times 10^{-1}$	$2.4 \times 10^1$	$6.6 \times 10^3$	$1.8 \times 10^5$
Zn-65	Zinc (30)	2.0	$5.4 \times 10^1$	2.0	$5.4 \times 10^1$	$3.0 \times 10^2$	$8.2 \times 10^3$
Zn-69	-	3.0	$8.1 \times 10^1$	$6.0 \times 10^{-1}$	$1.6 \times 10^1$	$1.8 \times 10^6$	$4.9 \times 10^7$
Zn-69m (a)	-	3.0	$8.1 \times 10^1$	$6.0 \times 10^{-1}$	$1.6 \times 10^1$	$1.2 \times 10^5$	$3.3 \times 10^6$
Zr-88	Zirconium (40)	3.0	$8.1 \times 10^1$	3.0	$8.1 \times 10^1$	$6.6 \times 10^2$	$1.8 \times 10^4$
Zr-93	-	Unlimited	Unlimited	Unlimited	Unlimited	$9.3 \times 10^{-5}$	$2.5 \times 10^{-3}$
Zr-95 (a)	-	2.0	$5.4 \times 10^1$	$8.0 \times 10^{-1}$	$2.2 \times 10^1$	$7.9 \times 10^2$	$2.1 \times 10^4$
Zr-97 (a)	-	$4.0 \times 10^{-1}$	$1.1 \times 10^1$	$4.0 \times 10^{-1}$	$1.1 \times 10^1$	$7.1 \times 10^4$	$1.9 \times 10^6$

<sup>a</sup>  $A_1$  and/or  $A_2$  values include contributions from daughter nuclides with half-lives less than 10 days.

<sup>b</sup> The values of  $A_1$  and  $A_2$  in Curies (Ci) are approximate and for information only; the regulatory standard units are

Terabecquerels (TBq). (see Appendix A to §175.105 - Determination of A<sub>1</sub> and A<sub>2</sub>, Section I).

<sup>c</sup> The quantity may be determined from a measurement of the rate of decay or a measurement of the radiation level at a prescribed distance from the source.

<sup>d</sup> These values apply only to compounds of uranium that take the chemical form of UF<sub>6</sub>, UO<sub>2</sub>F<sub>2</sub> and UO<sub>2</sub>(NO<sub>3</sub>)<sub>2</sub> in both normal and accident conditions of transport.

<sup>e</sup> These values apply only to compounds of uranium that take the chemical form of UO<sub>3</sub>, UF<sub>4</sub>, UCl<sub>4</sub> and hexavalent compounds in both normal and accident conditions of transport.

<sup>f</sup> These values apply to all compounds of uranium other than those specified in notes (d) and (e) of this table.

<sup>g</sup> These values apply to unirradiated uranium only.

<sup>h</sup> A<sub>1</sub> = 0.1 TBq (2.7 Ci) and A<sub>2</sub> = 0.001 TBq (0.027 Ci) for Cf-252 for domestic use.

<sup>i</sup> A<sub>2</sub> = 0.74 TBq (20 Ci) for Mo-99 for domestic use.

**Table A-2—EXEMPT MATERIAL ACTIVITY CONCENTRATIONS AND EXEMPT CONSIGNMENT ACTIVITY LIMITS FOR RADIONUCLIDES**

<u>Symbol of radionuclide</u>	<u>Element and atomic number</u>	<u>Activity concentration for exempt material (Bq/g)</u>	<u>Activity concentration for exempt material (Ci/g)</u>	<u>Activity limit for exempt consignment (Bq)</u>	<u>Activity limit for exempt consignment (Ci)</u>
<u>Ac-225</u>	<u>Actinium (89)</u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>
<u>Ac-227</u>	-	<u>1.0X10<sup>-1</sup></u>	<u>2.7X10<sup>-12</sup></u>	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>
<u>Ac-228</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Ag-105</u>	<u>Silver (47)</u>	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Ag-108m (b)</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Ag-110m</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Ag-111</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Al-26</u>	<u>Aluminum (13)</u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Am-241</u>	<u>Americium (95)</u>	<u>1.0</u>	<u>2.7X10<sup>-11</sup></u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>
<u>Am-242m (b)</u>	-	<u>1.0</u>	<u>2.7X10<sup>-11</sup></u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>
<u>Am-243 (b)</u>	-	<u>1.0</u>	<u>2.7X10<sup>-11</sup></u>	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>
<u>Ar-37</u>	<u>Argon (18)</u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>	<u>1.0X10<sup>8</sup></u>	<u>2.7X10<sup>-3</sup></u>
<u>Ar-39</u>	-	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>
<u>Ar-41</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>9</sup></u>	<u>2.7X10<sup>-2</sup></u>
<u>As-72</u>	<u>Arsenic (33)</u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>As-73</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>As-74</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>As-76</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>As-77</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>At-211</u>	<u>Astatine (85)</u>	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Au-193</u>	<u>Gold (79)</u>	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>

<u>Au-194</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Au-195</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Au-198</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Au-199</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Ba-131</u>	<u>Barium (56)</u>	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Ba-133</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Ba-133m</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Ba-140 (b)</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Be-7</u>	<u>Beryllium (4)</u>	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Be-10</u>	-	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Bi-205</u>	<u>Bismuth (83)</u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Bi-206</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Bi-207</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Bi-210</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Bi-210m</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Bi-212 (b)</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Bk-247</u>	<u>Berkelium (97)</u>	<u>1.0</u>	<u>2.7X10<sup>-11</sup></u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>
<u>Bk-249</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Br-76</u>	<u>Bromine (35)</u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Br-77</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Br-82</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>C-11</u>	<u>Carbon (6)</u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>C-14</u>	-	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Ca-41</u>	<u>Calcium (20)</u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Ca-45</u>	-	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Ca-47</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Cd-109</u>	<u>Cadmium (48)</u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Cd-113m</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Cd-115</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Cd-115m</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Ce-139</u>	<u>Cerium (58)</u>	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Ce-141</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Ce-143</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>

<u>Ce-144 (b)</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Cf-248</u>	<u>Californium (98)</u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>
<u>Cf-249</u>	-	<u>1.0</u>	<u>2.7X10<sup>-11</sup></u>	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>
<u>Cf-250</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>
<u>Cf-251</u>	-	<u>1.0</u>	<u>2.7X10<sup>-11</sup></u>	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>
<u>Cf-252</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>
<u>Cf-253</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Cf-254</u>	-	<u>1.0</u>	<u>2.7X10<sup>-11</sup></u>	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>
<u>Cl-36</u>	<u>Chlorine (17)</u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Cl-38</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Cm-240</u>	<u>Curium (96)</u>	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Cm-241</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Cm-242</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Cm-243</u>	-	<u>1.0</u>	<u>2.7X10<sup>-11</sup></u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>
<u>Cm-244</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>
<u>Cm-245</u>	-	<u>1.0</u>	<u>2.7X10<sup>-11</sup></u>	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>
<u>Cm-246</u>	-	<u>1.0</u>	<u>2.7X10<sup>-11</sup></u>	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>
<u>Cm-247</u>	-	<u>1.0</u>	<u>2.7X10<sup>-11</sup></u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>
<u>Cm-248</u>	-	<u>1.0</u>	<u>2.7X10<sup>-11</sup></u>	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>
<u>Co-55</u>	<u>Cobalt (27)</u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Co-56</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Co-57</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Co-58</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Co-58m</u>	-	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Co-60</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Cr-51</u>	<u>Chromium (24)</u>	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Cs-129</u>	<u>Cesium (55)</u>	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Cs-131</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Cs-132</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Cs-134</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>
<u>Cs-134m</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Cs-135</u>	-	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Cs-136</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>

<u>Cs-137 (b)</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$
<u>Cu-64</u>	<u>Copper (29)</u>	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Cu-67</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Dy-159</u>	<u>Dysprosium (66)</u>	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Dy-165</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Dy-166</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Er-169</u>	<u>Erbium (68)</u>	$1.0 \times 10^4$	$2.7 \times 10^{-7}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Er-171</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Eu-147</u>	<u>Europium (63)</u>	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Eu-148</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Eu-149</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Eu-150 (short lived)</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Eu-150 (long lived)</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Eu-152</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Eu-152m</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Eu-154</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Eu-155</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Eu-156</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>F-18</u>	<u>Fluorine (9)</u>	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Fe-52</u>	<u>Iron (26)</u>	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Fe-55</u>	-	$1.0 \times 10^4$	$2.7 \times 10^{-7}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Fe-59</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Fe-60</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>Ga-67</u>	<u>Gallium (31)</u>	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Ga-68</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>Ga-72</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>Gd-146</u>	<u>Gadolinium (64)</u>	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Gd-148</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$
<u>Gd-153</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Gd-159</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Ge-68</u>	<u>Germanium (32)</u>	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>Ge-71</u>	-	$1.0 \times 10^4$	$2.7 \times 10^{-7}$	$1.0 \times 10^8$	$2.7 \times 10^{-3}$
<u>Ge-77</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$

<u>Hf-172</u>	<u>Hafnium (72)</u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Hf-175</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Hf-181</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Hf-182</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Hg-194</u>	<u>Mercury (80)</u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Hg-195m</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Hg-197</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Hg-197m</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Hg-203</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Ho-166</u>	<u>Holmium (67)</u>	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Ho-166m</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>I-123</u>	<u>Iodine (53)</u>	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>I-124</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>I-125</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>I-126</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>I-129</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>I-131</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>I-132</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>I-133</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>I-134</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>I-135</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>In-111</u>	<u>Indium (49)</u>	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>In-113m</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>In-114m</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>In-115m</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Ir-189</u>	<u>Iridium (77)</u>	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Ir-190</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Ir-192</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>
<u>Ir-194</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>K-40</u>	<u>Potassium (19)</u>	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>K-42</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>K-43</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Kr-81</u>	<u>Krypton (36)</u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>

<u>Kr-85</u>	-	$1.0 \times 10^5$	$2.7 \times 10^{-6}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$
<u>Kr-85m</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^{10}$	$2.7 \times 10^{-1}$
<u>Kr-87</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^9$	$2.7 \times 10^{-2}$
<u>La-137</u>	<u>Lanthanum (57)</u>	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>La-140</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>Lu-172</u>	<u>Lutetium (71)</u>	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Lu-173</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Lu-174</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Lu-174m</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Lu-177</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Mg-28</u>	<u>Magnesium (12)</u>	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>Mn-52</u>	<u>Manganese (25)</u>	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>Mn-53</u>	-	$1.0 \times 10^4$	$2.7 \times 10^{-7}$	$1.0 \times 10^9$	$2.7 \times 10^{-2}$
<u>Mn-54</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Mn-56</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>Mo-93</u>	<u>Molybdenum (42)</u>	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^8$	$2.7 \times 10^{-3}$
<u>Mo-99</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>N-13</u>	<u>Nitrogen (7)</u>	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^9$	$2.7 \times 10^{-2}$
<u>Na-22</u>	<u>Sodium (11)</u>	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Na-24</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>Nb-93m</u>	<u>Niobium (41)</u>	$1.0 \times 10^4$	$2.7 \times 10^{-7}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Nb-94</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Nb-95</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Nb-97</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Nd-147</u>	<u>Neodymium (60)</u>	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Nd-149</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Ni-59</u>	<u>Nickel (28)</u>	$1.0 \times 10^4$	$2.7 \times 10^{-7}$	$1.0 \times 10^8$	$2.7 \times 10^{-3}$
<u>Ni-63</u>	-	$1.0 \times 10^5$	$2.7 \times 10^{-6}$	$1.0 \times 10^8$	$2.7 \times 10^{-3}$
<u>Ni-65</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Np-235</u>	<u>Neptunium (93)</u>	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Np-236 (short-lived)</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Np-236 (long-lived)</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>Np-237 (b)</u>	-	1.0	$2.7 \times 10^{-11}$	$1.0 \times 10^3$	$2.7 \times 10^{-8}$

<u>Np-239</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Os-185</u>	<u>Osmium (76)</u>	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Os-191</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Os-191m</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Os-193</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Os-194</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>P-32</u>	<u>Phosphorus (15)</u>	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>P-33</u>	-	$1.0 \times 10^5$	$2.7 \times 10^{-6}$	$1.0 \times 10^8$	$2.7 \times 10^{-3}$
<u>Pa-230</u>	<u>Protactinium (91)</u>	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Pa-231</u>	-	1.0	$2.7 \times 10^{-11}$	$1.0 \times 10^3$	$2.7 \times 10^{-8}$
<u>Pa-233</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Pb-201</u>	<u>Lead (82)</u>	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Pb-202</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Pb-203</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Pb-205</u>	-	$1.0 \times 10^4$	$2.7 \times 10^{-7}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Pb-210 (b)</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$
<u>Pb-212 (b)</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>Pd-103</u>	<u>Palladium (46)</u>	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^8$	$2.7 \times 10^{-3}$
<u>Pd-107</u>	-	$1.0 \times 10^5$	$2.7 \times 10^{-6}$	$1.0 \times 10^8$	$2.7 \times 10^{-3}$
<u>Pd-109</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Pm-143</u>	<u>Promethium (61)</u>	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Pm-144</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Pm-145</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Pm-147</u>	-	$1.0 \times 10^4$	$2.7 \times 10^{-7}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Pm-148m</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Pm-149</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Pm-151</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Po-210</u>	<u>Polonium (84)</u>	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$
<u>Pr-142</u>	<u>Praseodymium (59)</u>	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>Pr-143</u>	-	$1.0 \times 10^4$	$2.7 \times 10^{-7}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Pt-188</u>	<u>Platinum (78)</u>	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Pt-191</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Pt-193</u>	-	$1.0 \times 10^4$	$2.7 \times 10^{-7}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$

<u>Pt-193m</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Pt-195m</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Pt-197</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Pt-197m</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Pu-236</u>	<u>Plutonium (94)</u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>
<u>Pu-237</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Pu-238</u>	-	<u>1.0</u>	<u>2.7X10<sup>-11</sup></u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>
<u>Pu-239</u>	-	<u>1.0</u>	<u>2.7X10<sup>-11</sup></u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>
<u>Pu-240</u>	-	<u>1.0</u>	<u>2.7X10<sup>-11</sup></u>	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>
<u>Pu-241</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Pu-242</u>	-	<u>1.0</u>	<u>2.7X10<sup>-11</sup></u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>
<u>Pu-244</u>	-	<u>1.0</u>	<u>2.7X10<sup>-11</sup></u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>
<u>Ra-223 (b)</u>	<u>Radium (88)</u>	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Ra-224 (b)</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Ra-225</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Ra-226 (b)</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>
<u>Ra-228 (b)</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Rb-81</u>	<u>Rubidium (37)</u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Rb-83</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Rb-84</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Rb-86</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Rb-87</u>	-	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Rb(nat)</u>	-	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Re-184</u>	<u>Rhenium (75)</u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Re-184m</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Re-186</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Re-187</u>	-	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>	<u>1.0X10<sup>9</sup></u>	<u>2.7X10<sup>-2</sup></u>
<u>Re-188</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Re-189</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Re(nat)</u>	-	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>	<u>1.0X10<sup>9</sup></u>	<u>2.7X10<sup>-2</sup></u>
<u>Rh-99</u>	<u>Rhodium (45)</u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Rh-101</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Rh-102</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>

<u>Rh-102m</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Rh-103m</u>	-	$1.0 \times 10^4$	$2.7 \times 10^{-7}$	$1.0 \times 10^8$	$2.7 \times 10^{-3}$
<u>Rh-105</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Rn-222 (b)</u>	<u>Radon (86)</u>	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^8$	$2.7 \times 10^{-3}$
<u>Ru-97</u>	<u>Ruthenium (44)</u>	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Ru-103</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Ru-105</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Ru-106 (b)</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>S-35</u>	<u>Sulphur (16)</u>	$1.0 \times 10^5$	$2.7 \times 10^{-6}$	$1.0 \times 10^8$	$2.7 \times 10^{-3}$
<u>Sb-122</u>	<u>Antimony (51)</u>	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$
<u>Sb-124</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Sb-125</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Sb-126</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>Sc-44</u>	<u>Scandium (21)</u>	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>Sc-46</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Sc-47</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Sc-48</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>Se-75</u>	<u>Selenium (34)</u>	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Se-79</u>	-	$1.0 \times 10^4$	$2.7 \times 10^{-7}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Si-31</u>	<u>Silicon (14)</u>	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Si-32</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Sm-145</u>	<u>Samarium (62)</u>	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Sm-147</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$
<u>Sm-151</u>	-	$1.0 \times 10^4$	$2.7 \times 10^{-7}$	$1.0 \times 10^8$	$2.7 \times 10^{-3}$
<u>Sm-153</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Sn-113</u>	<u>Tin (50)</u>	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Sn-117m</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Sn-119m</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Sn-121m</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Sn-123</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Sn-125</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>Sn-126</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>Sr-82</u>	<u>Strontium (38)</u>	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$

<u>Sr-85</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Sr-85m</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Sr-87m</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Sr-89</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Sr-90 (b)</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>
<u>Sr-91</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Sr-92</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>T(H-3)</u>	<u>Tritium (1)</u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>	<u>1.0X10<sup>9</sup></u>	<u>2.7X10<sup>-2</sup></u>
<u>Ta-178 (long-lived)</u>	<u>Tantalum (73)</u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Ta-179</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Ta-182</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>
<u>Tb-157</u>	<u>Terbium (65)</u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Tb-158</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Tb-160</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Tc-95m</u>	<u>Technetium (43)</u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Tc-96</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Tc-96m</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Tc-97</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>8</sup></u>	<u>2.7X10<sup>-3</sup></u>
<u>Tc-97m</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Tc-98</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Tc-99</u>	-	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Tc-99m</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Te-121</u>	<u>Tellurium (52)</u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Te-121m</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>5</sup></u>	<u>2.7X10<sup>-6</sup></u>
<u>Te-123m</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Te-125m</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Te-127</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Te-127m</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Te-129</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Te-129m</u>	-	<u>1.0X10<sup>3</sup></u>	<u>2.7X10<sup>-8</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Te-131m</u>	-	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>6</sup></u>	<u>2.7X10<sup>-5</sup></u>
<u>Te-132</u>	-	<u>1.0X10<sup>2</sup></u>	<u>2.7X10<sup>-9</sup></u>	<u>1.0X10<sup>7</sup></u>	<u>2.7X10<sup>-4</sup></u>
<u>Th-227</u>	<u>Thorium (90)</u>	<u>1.0X10<sup>1</sup></u>	<u>2.7X10<sup>-10</sup></u>	<u>1.0X10<sup>4</sup></u>	<u>2.7X10<sup>-7</sup></u>

Th-228 (b)	-	1.0	$2.7 \times 10^{-11}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$
Th-229 (b)	-	1.0	$2.7 \times 10^{-11}$	$1.0 \times 10^3$	$2.7 \times 10^{-8}$
Th-230	-	1.0	$2.7 \times 10^{-11}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$
Th-231	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
Th-232	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$
Th-234 (b)	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
Th (nat) (b)	-	1.0	$2.7 \times 10^{-11}$	$1.0 \times 10^3$	$2.7 \times 10^{-8}$
Ti-44	Titanium (22)	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
Tl-200	Thallium (81)	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
Tl-201	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
Tl-202	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
Tl-204	-	$1.0 \times 10^4$	$2.7 \times 10^{-7}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$
Tm-167	Thulium (69)	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
Tm-170	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
Tm-171	-	$1.0 \times 10^4$	$2.7 \times 10^{-7}$	$1.0 \times 10^8$	$2.7 \times 10^{-3}$
U-230 (fast lung absorption) (b),(d)	Uranium (92)	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
U-230 (medium lung absorption) (e)	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$
U-230 (slow lung absorption) (f)	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$
U-232 (fast lung absorption) (b),(d)	-	1.0	$2.7 \times 10^{-11}$	$1.0 \times 10^3$	$2.7 \times 10^{-8}$
U-232 (medium lung absorption) (e)	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$
U-232 (slow lung absorption) (f)	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$
U-233 (fast lung absorption) (d)	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$
U-233 (medium lung absorption) (e)	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
U-233 (slow lung absorption) (f)	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
U-234 (fast lung absorption) (d)	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$
U-234 (medium lung absorption) (e)	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
U-234 (slow lung absorption) (f)	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
U-235 (all lung absorption types) (b),(d),(e),(f)	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$

<u>U-236 (fast lung absorption) (d)</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$
<u>U-236 (medium lung absorption) (e)</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>U-236 (slow lung absorption) (f)</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$
<u>U-238 (all lung absorption types) (b),(d),(e),(f)</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$
<u>U (nat) (b)</u>	-	1.0	$2.7 \times 10^{-11}$	$1.0 \times 10^3$	$2.7 \times 10^{-8}$
<u>U (enriched to 20% or less) (g)</u>	-	1.0	$2.7 \times 10^{-11}$	$1.0 \times 10^3$	$2.7 \times 10^{-8}$
<u>U (dep)</u>	-	1.0	$2.7 \times 10^{-11}$	$1.0 \times 10^3$	$2.7 \times 10^{-8}$
<u>V-48</u>	<u>Vanadium (23)</u>	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>V-49</u>	-	$1.0 \times 10^4$	$2.7 \times 10^{-7}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>W-178</u>	<u>Tungsten (74)</u>	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>W-181</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>W-185</u>	-	$1.0 \times 10^4$	$2.7 \times 10^{-7}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>W-187</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>W-188</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>Xe-122</u>	<u>Xenon (54)</u>	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^9$	$2.7 \times 10^{-2}$
<u>Xe-123</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^9$	$2.7 \times 10^{-2}$
<u>Xe-127</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>Xe-131m</u>	-	$1.0 \times 10^4$	$2.7 \times 10^{-7}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$
<u>Xe-133</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^4$	$2.7 \times 10^{-7}$
<u>Xe-135</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^{10}$	$2.7 \times 10^{-1}$
<u>Y-87</u>	<u>Yttrium (39)</u>	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Y-88</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Y-90</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>Y-91</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Y-91m</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Y-92</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>Y-93</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$
<u>Yb-169</u>	<u>Ytterbium (70)</u>	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Yb-175</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Zn-65</u>	<u>Zinc (30)</u>	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$

<u>Zn-69</u>	-	$1.0 \times 10^4$	$2.7 \times 10^{-7}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Zn-69m</u>	-	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Zr-88</u>	<u>Zirconium (40)</u>	$1.0 \times 10^2$	$2.7 \times 10^{-9}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Zr-93 (b)</u>	-	$1.0 \times 10^3$	$2.7 \times 10^{-8}$	$1.0 \times 10^7$	$2.7 \times 10^{-4}$
<u>Zr-95</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^6$	$2.7 \times 10^{-5}$
<u>Zr-97 (b)</u>	-	$1.0 \times 10^1$	$2.7 \times 10^{-10}$	$1.0 \times 10^5$	$2.7 \times 10^{-6}$

<sup>a</sup> [Reserved]

<sup>b</sup> Parent nuclides and their progeny included in secular equilibrium are listed in the following:

<u>Sr-90</u>	<u>Y-90</u>
<u>Zr-93</u>	<u>Nb-93m</u>
<u>Zr-97</u>	<u>Nb-97</u>
<u>Ru-106</u>	<u>Rh-106</u>
<u>Cs-137</u>	<u>Ba-137m</u>
<u>Ce-134</u>	<u>La-134</u>
<u>Ce-144</u>	<u>Pr-144</u>
<u>Ba-140</u>	<u>La-140</u>
<u>Bi-212</u>	<u>Tl-208 (0.36), Po-212 (0.64)</u>
<u>Pb-210</u>	<u>Bi-210, Po-210</u>
<u>Pb-212</u>	<u>Bi-212, Tl-208 (0.36), Po-212 (0.64)</u>
<u>Rn-220</u>	<u>Po-216</u>
<u>Rn-222</u>	<u>Po-218, Pb-214, Bi-214, Po-214</u>
<u>Ra-223</u>	<u>Rn-219, Po-215, Pb-211, Bi-211, Tl-207</u>
<u>Ra-224</u>	<u>Rn-220, Po-216, Pb-212, Bi-212, Tl-208(0.36), Po-212 (0.64)</u>
<u>Ra-226</u>	<u>Rn-222, Po-218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210</u>
<u>Ra-228</u>	<u>Ac-228</u>
<u>Th-226</u>	<u>Ra-222, Rn-218, Po-214</u>
<u>Th-228</u>	<u>Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)</u>
<u>Th-229</u>	<u>Ra-225, Ac-225, Fr-221, At-217, Bi-213, Po-213, Pb-209</u>
<u>Th-nat</u>	<u>Ra-228, Ac-228, Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)</u>
<u>Th-234</u>	<u>Pa-234m</u>
<u>U-230</u>	<u>Th-226, Ra-222, Rn-218, Po-214</u>
<u>U-232</u>	<u>Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)</u>
<u>U-235</u>	<u>Th-231</u>
<u>U-238</u>	<u>Th-234, Pa-234m</u>
<u>U-nat</u>	<u>Th-234, Pa-234m, U-234, Th-230, Ra-226, Rn-222, Po-218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210</u>
<u>U-240</u>	<u>Np-240m</u>
<u>Np-237</u>	<u>Pa-233</u>
<u>Am-242m</u>	<u>Am-242</u>
<u>Am-243</u>	<u>Np-239</u>

<sup>c</sup> [Reserved]

<sup>d</sup> These values apply only to compounds of uranium that take the chemical form of  $UF_6$ ,  $UO_2F_2$  and  $UO_2(NO_3)_2$  in both normal and accident conditions of transport.

<sup>e</sup> These values apply only to compounds of uranium that take the chemical form of  $UO_3$ ,  $UF_4$ ,  $UCl_4$  and hexavalent compounds in both normal and accident conditions of transport.

<sup>f</sup> These values apply to all compounds of uranium other than those specified in notes (d) and (e) of this table.

<sup>g</sup> These values apply to unirradiated uranium only.

**TABLE A-3—GENERAL VALUES FOR A<sub>1</sub> AND A<sub>2</sub>**

<u>Contents</u>	<u>A<sub>1</sub></u>		<u>A<sub>2</sub></u>		<u>Activity concentration for exempt material (Bq/g)</u>	<u>Activity concentration for exempt material (Ci/g)</u>	<u>Activity limits for exempt consignments (Bq)</u>	<u>Activity limits for exempt consignments (Ci)</u>
	<u>(TBq)</u>	<u>(Ci)</u>	<u>(TBq)</u>	<u>(Ci)</u>				
Only beta or gamma emitting radionuclides are known to be present	$1 \times 10^{-1}$	$2.7 \times 10^0$	$2 \times 10^{-2}$	$5.4 \times 10^{-1}$	$1 \times 10^1$	$2.7 \times 10^{-10}$	$1 \times 10^4$	$2.7 \times 10^{-7}$
Only alpha emitting radionuclides are known to be present	$2 \times 10^{-1}$	$5.4 \times 10^0$	$9 \times 10^{-5}$	$2.4 \times 10^{-3}$	$1 \times 10^{-1}$	$2.7 \times 10^{-12}$	$1 \times 10^3$	$2.7 \times 10^{-8}$
No relevant data are available	$1 \times 10^{-3}$	$2.7 \times 10^{-2}$	$9 \times 10^{-5}$	$2.4 \times 10^{-3}$	$1 \times 10^{-1}$	$2.7 \times 10^{-12}$	$1 \times 10^3$	$2.7 \times 10^{-8}$

**TABLE A-4—ACTIVITY-MASS RELATIONSHIPS FOR URANIUM**

<u>Uranium Enrichment<sup>1</sup></u> <u>wt % U-235 present</u>	<u>Specific Activity</u>	
	<u>TBq/g</u>	<u>Ci/g</u>
<u>0.45</u>	$1.8 \times 10^{-8}$	$5.0 \times 10^{-7}$
<u>0.72</u>	$2.6 \times 10^{-8}$	$7.1 \times 10^{-7}$
<u>1</u>	$2.8 \times 10^{-8}$	$7.6 \times 10^{-7}$
<u>1.5</u>	$3.7 \times 10^{-8}$	$1.0 \times 10^{-6}$
<u>5</u>	$1.0 \times 10^{-7}$	$2.7 \times 10^{-6}$
<u>10</u>	$1.8 \times 10^{-7}$	$4.8 \times 10^{-6}$
<u>20</u>	$3.7 \times 10^{-7}$	$1.0 \times 10^{-5}$
<u>35</u>	$7.4 \times 10^{-7}$	$2.0 \times 10^{-5}$
<u>50</u>	$9.3 \times 10^{-7}$	$2.5 \times 10^{-5}$
<u>90</u>	$2.2 \times 10^{-6}$	$5.8 \times 10^{-5}$
<u>93</u>	$2.6 \times 10^{-6}$	$7.0 \times 10^{-5}$
<u>95</u>	$3.4 \times 10^{-6}$	$9.1 \times 10^{-5}$

<sup>1</sup> The figures for uranium include representative values for the activity of the uranium-234 that is concentrated during the enrichment process.

(60 FR 50264, Sept. 28, 1995 as amended at 61 FR 28724, June 6, 1996; 69 FR 3800, Jan. 26, 2004).

Notes: The Board of Health proposes that multiple provisions of Health Code §175.105 be amended, including the repeal and reenactment of §175.105 Appendix A, in order to maintain compatibility with applicable NRC regulations found in various provisions of 10 CFR Part 71 relating to the transportation and packaging of radioactive material.

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