

# $\alpha\beta\gamma$ -Table ©

## – Radionuclide-Handbook – for Laboratory Workers in Spectrometry, Radiation Protection and Medicine

Wolfgang Wahl

Version 5.4 January 2018 (since 23 Years)

\*\* $\beta$  & IT-decay: total absolute intensity  $\Sigma(\beta + IT) \approx 100\%$ ; \* $\gamma$ -emission: intensity per 100 decays in equilibrium with U-238;

isotope reference $Q_\alpha, Q_\beta$ MeV $t_{1/2}$	$\alpha$ -, $\beta$ -decay IT, sf $E_\alpha, E_\beta^{max}, (\bar{E}_\beta)$ MeV	$\beta$ , IT, sf branch intens.** %	daughter-nuclide & $E_\gamma$ $\gamma$ -ray transition (cascade) to final state ( $t_{1/2}$ ) $E_\gamma$ in keV	E-list in I-order keV	$\gamma$ - intensity* %
<sup>234m</sup> <sub>91</sub> Pa NDS,108,681,2007	→ $\beta^-$ : → IT: → sf:	99.84 <sub>4</sub> 0.16 <sub>4</sub> 3.E-9	→ <sup>234</sup> <sub>92</sub> U( $t_{1/2}=2.455 \cdot 10^5$ y) → $\gamma$ : 73.92 <sup>M1,E2</sup> → <sup>234</sup> <sub>91</sub> Pa(6.70 h) ADDITIONAL ENERGIES SEE PAGE 14	$\gamma_{IT}$ : 73.92 <sub>2</sub> 1001.03 <sub>10</sub> 766.42 <sub>10</sub>	0.013 <sub>?</sub> 0.842 <sub>8</sub> 0.317 <sub>5</sub>
<sup>234m</sup> <sub>91</sub> Pa  $Q_\beta=2.195_4$ 1.159 <sub>16</sub> m	→ $\beta^-$ : 2.269 <sub>7</sub> → $\beta^-$ : 1.483 <sub>8</sub> (0.811 <sub>2</sub> ) → $\beta^-$ : 1.459 <sub>8</sub> → $\beta^-$ : 1.224 <sub>8</sub>	97.57 <sub>6</sub> 0.059 <sub>4</sub> 0.948 <sub>13</sub> 1.002 <sub>3</sub>	→ <sup>234</sup> <sub>92</sub> U $\alpha$ 's → <sup>226</sup> <sub>88</sub> Ra → $\gamma$ : 742.81 <sup>int,E1</sup> , 43.50 <sup>E2</sup> $\gamma$ : 786.28 <sup>int,E1</sup> → $\gamma$ : 766.42 <sup>E2</sup> , 43.50 → $\gamma$ : 1001.03 <sup>E2</sup> , 43.50	742.813 <sub>5</sub> 258.227 <sup>int</sup> <sub>3</sub> 786.28 <sub>10</sub> 1737.75 <sub>10</sub> 1831.26 <sub>10</sub>	0.1066 <sub>23</sub> 0.0764 <sub>21</sub> 0.0544 <sub>8</sub> 0.0213 <sub>3</sub> 0.01742 <sub>24</sub>
<b>int</b> = <sup>214</sup> Pb(258.86, .524%), <sup>214</sup> Bi(DE 742.49), <sup>212</sup> Bi(785.37, 1.10%), <sup>214</sup> Pb(785.96, 1.07%), <sup>214</sup> Bi(786.35, .32%)					

- More than 250 Radio-Isotopes (State of Data: December 2016)
- Decay Scheme in Form of a Listmode: primary  $\alpha$ - $\beta$ - $\epsilon$ -IT-sf- $\gamma$ -x-ray data
- $\alpha$ - $\beta$ - $\epsilon$ -IT-sf - Branches incl. Energies, Emission Probabilities, Half-Lives, ...
- Natural Radioisotopes incl. Cosmic Radiation: Decay Chains & all Details
- Actinides: U/Th n-Activation Process, Decay-Series and Isotope-Details
- Anthropogenic Isotopes: Fission & Activation Products as well as
- Radioisotopes in Nuclear Medicine: Therapy, Diagnostic, PET, Iodines, ...
- Calibration Radioisotopes: Standard, Low Energy, Multi-Photon, ...
- Radioisotopes in Low Background Spectra incl. (n, $\gamma$ ), (n,n' $\gamma$ ), ... reactions
- X-ray Lists of Naturals, Actinides, Calibration & Man-Made Radioisotopes
- Indicated Reference- (cyan) and Interference- (int) lines as well as cascade coincidence (!) & cross-over decay (pcd) and sum-energies
- Nuclide & Isotope Index, References;  $\alpha$ - and  $\gamma$ -Energy Lists per Chapter

© ISuS: Copyright, All Rights Reserved