

## <sup>90</sup>Sr - Comments on evaluation of decay data by V. Chisté

This evaluation was completed in 2005. The literature available by August 2005 was included.

### 1 Decay Scheme

<sup>90</sup>Sr disintegrates by  $\beta^-$  emission to the fundamental level of <sup>90</sup>Y ( $T_{1/2} = 2.6684(13)$  d). The decay scheme and level spins and parities are from the evaluation of E. Browne (1997Br34).

### 2 Nuclear Data

The Q value is from the atomic mass evaluation of Audi *et al.* (2003Au03).

The <sup>90</sup>Sr half-life has been evaluated from the following data (in days):

1950Po67	7 270 (110)
1955Wi15	10 117 (146)
1958An40	10 702 (584)
1965Fl01	10 227 (146)
1965Fl01	10 410 (329)
1965An07	10 527 (51)
1978La21	10 282 (13)
1983Ra09	10 589 (92)
1989Ko57	10 665 (37)
1992ScZZ	10 513 (14)
1994Ma50	10 561 (14)
1996Wo06	10 495 (4)
2004Sc04	10 557 (11)
Adopted	<b>10 522 (27) d or 28.80 (7) y</b>

The half-life experimental values of 1950Po67 (7 270 (110) d), 1955Wi15 (10 117 (146) d), 1978La21 (10 282 (13) d), 1983Ra09 (10 589 (92) d) are rejected by the evaluator following the recommendation given by 1996Wo06.

The half-life weighted average has been calculated by LWEIGHT computer program (version 3).

The evaluator has chosen to take into account the nine values with associated uncertainty for the calculation. One of them (10 227 (146) d) from Flynn (1965Fl01) is rejected by the LWEIGHT computer program, based on the Chauvenet's criterion. The largest contribution to the weighted average comes from the value of Woods (1996Wo06) amounting to 76 %. The LWEIGHT program has increased the uncertainty of the 1996Wo06 value from 4.0 to 7.1 in order to reduce its relative weight from 76 % to 50 %.

The recommended value is the weighted average of 10 522 d, with an uncertainty of 27 d (expanded so range includes the most precise value of Woods (1996Wo06)) (i.e. 28.80 (7) y),. The reduced  $\chi^2$  value is 8.

## 2.1 $\beta^-$ Transitions

The maximum energy of the  $\beta^-$  transition in the decay of <sup>90</sup>Sr to ground state in <sup>90</sup>Y has been adopted from the Q value of 2003Au03 ( $E_{\beta^-} = Q = 545.9$  (14) keV), and is in agreement with the experimental value of 546.0 (16) keV, measured with a magnetic  $\beta$ -ray spectrometer (1983Ha15).

The lg ft value (9.3) for the 546-keV unique first forbidden transition and mean energy value (196 (1) keV) have been calculated with the Logft computer program (version 7.2a).

For measured first forbidden shape factors, see 1964Da16 and 1983Ha35.

## 3 Atomic Data

Atomic values,  $\omega_K$ ,  $\omega_L$  and  $n_{KL}$ , are from Schönfeld and Janßen (1996Sc06).

## 4 References

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