35S - Comments on Evaluation of Decay Data
by V.G. Chechev

1. Half-Life

In the literature there are many measurements of the \( ^{35}\text{S} \) half-life and they were all made before 1970 (Table 1). Omitting the measurements results without uncertainties /5,6/, the recommended value of \( T_{1/2}(^{35}\text{S}) \) could be obtained as the weighted average of the 11 values /1-3,7-14/. However, since the available data set is discrepant and the \( \chi^2 \) value (=66,6) exceeds the tabulated \( \chi^2_{0,05} = 18,3 \) more than three times, the recommended value has been obtained using the modified Bayesian procedure (MBAYS) /15/; this gives \( T_{1/2}(^{35}\text{S}) = 87,32(16) \) days.

<table>
<thead>
<tr>
<th>Year</th>
<th>Half-life of ( ^{35}\text{S} ), days</th>
<th>Measurement method</th>
<th>Reference No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1940</td>
<td>88(5)</td>
<td>GM</td>
<td>40Le**</td>
</tr>
<tr>
<td>1941</td>
<td>88(3)</td>
<td>GM</td>
<td>41Ka**</td>
</tr>
<tr>
<td>1943</td>
<td>87,1(12)</td>
<td>GM</td>
<td>43He**</td>
</tr>
<tr>
<td>(1947)</td>
<td></td>
<td></td>
<td>(47Hu06)</td>
</tr>
<tr>
<td>1949</td>
<td>88</td>
<td>GM</td>
<td>49Ma**</td>
</tr>
<tr>
<td>1952</td>
<td>80</td>
<td>GM</td>
<td>52Ru23</td>
</tr>
<tr>
<td>1958</td>
<td>87,16(10)</td>
<td>pc</td>
<td>58Se49</td>
</tr>
<tr>
<td>1959</td>
<td>88,8(10)</td>
<td>pc</td>
<td>59Ca12</td>
</tr>
<tr>
<td>1959</td>
<td>86,35(17)</td>
<td>pc</td>
<td>59Co56</td>
</tr>
<tr>
<td>1961</td>
<td>89,0(5)</td>
<td>pc</td>
<td>61Wy01</td>
</tr>
<tr>
<td>1961</td>
<td>87,1(9)</td>
<td>calorim</td>
<td>61Oz01</td>
</tr>
<tr>
<td>1965</td>
<td>87,9(3)</td>
<td>pc</td>
<td>65Fl02</td>
</tr>
<tr>
<td>1968</td>
<td>87,39(10)</td>
<td>4\pi pc</td>
<td>68Wo06</td>
</tr>
<tr>
<td>1969</td>
<td>87,48(13)*</td>
<td>4\pi pc</td>
<td>69La34</td>
</tr>
</tbody>
</table>

Weighted average /1-3,7-14/ 87,32(6) days
Unweighted average /1-3,7-14/ 87,69(24) days
Recommended value 87,32(16) days

Conventional designations in the third column:
measurement of counting rate decrease by Geiger-Müller counter (GM),
proportional counter (pc),
calorimeter (calorim),
4\pi proportional counter (4\pi pc).

*) In /14/ the uncertainty of \( \pm 0,40 \) days is given for the confidence level of 0,99 (3\( \sigma \)).
** NSR keynumber is not found
2. Decay Energy and Characteristics of Electron Emission (β-)

The decay energy of $^{35}\text{S}$ has been adopted using the evaluations of Audi and Wapstra /16, 17/. The end-point of the $^{35}\text{S}$ β-spectrum has been obtained from the correlation

$$E_{98}^\beta = Q_{98}^\beta - E_r$$

where $E_r = 3$ eV is the maximum recoil energy of $^{35}\text{Cl}$ atom.

The average energy of the electrons per disintegration has been calculated for an allowed form of β-spectrum (see/18/) taking into account the adopted value of $Q_{98}^\beta$.

3. References

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11. Y. Ozias et al., Compt.rend. 253(1961)2944 [T\text{1/2}]
   [Evaluation technique]