

**¹⁰⁶Ru – Comments on evaluation of decay data
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Evaluation completed: February 2012

Literature cut-off date: September 2011

Evaluation procedure

Weighted mean analyses were applied to determine recommended values throughout the evaluation when the data were in statistical agreement. When the data were not in statistical agreement, the Limitation of Relative Statistical Weights (LRSW) was used. Uncertainties were expanded to match the minimum input uncertainty where appropriate.

Decay scheme

¹⁰⁶Ru disintegrates by beta minus emission to the ground state of ¹⁰⁶Rh. The spin and parity of ¹⁰⁶Rh ($J^\pi=1+$) are taken from the mass-chain evaluation of De Frenne (2008De09).

The Q^- value of 39.40 (21) keV is taken from the evaluation of Wang et al. (2012Wa38).

Half-life

The experimental half-life values used for calculating the recommended value are given in Table 1. The half-life value from Walz (1983Wa26) was omitted from the analysis as a more recent publication was available from the same laboratory (Schrader, 2004Sc04).

The AveTool computer code was used to calculate the average using three statistical methods: Limitation of Relative Statistical Weights (LRSW), Normalised Residual Methods (NRM) and the Rajeval Technique (RT).

The data set is discrepant with a reduced- χ^2 of 12.1 (@ 99 % confidence level) on the weighted mean (WM) which is larger than the critical reduced- χ^2 of 2.80. The recommended value of 371.5 (21) days is calculated using LRSW technique and was chosen as it includes the most precise value from Houtermans (1980Ho17).

Table 1. Experimental half-life values of ¹⁰⁶Ru.

Reference	Half-life (days)	Comments
1956Sc87	366.6 (9)	Published as 1.02 (1) year
1957Me47	373 (4)	
1960Ea02	365.8 (17)	
1961Wy01	368.0 (18)	
1965Fl02	371 (1)	
1980Ho17	373.59 (15)	Not included in averaging
1983Wa26	371.7 (15)	
2004Sc04	370.5 (6)	
UWM	369.7 (11)	reduced- $\chi^2 = 12.1$
WM	371.47 (30)	
LRSW	371.5 (21)	
NRM	370.3 (7)	
RT	370.4 (5)	
Recommended value	371.5 (21)	

Beta particles

The maximum beta-particle emission energy was derived from the $Q(\beta^-) = 39.40$ (21) keV value from Wang et al. (2012Wa38).

The mean beta-particle energy and $\log ft$ values were calculated from the LOGFT code.

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