

Adopted Levels

Type	History		Literature Cutoff Date
	Author	Citation	
Full Evaluation	Balraj Singh	ENSDF	10-Jun-2015

Q(β^-)=11900 SY; S(n)=4380 SY; S(p)=14860 SY; Q(α)=-11180 SY [2012Wa38](#)
 Estimated uncertainties ([2012Wa38](#)): 590 for Q(β^-), 710 for S(n); 780 for S(p), 640 for Q(α).
 S(2n)=7690 710, Q(β^- n)=8470 540 (syst,[2012Wa38](#)). S(2p)=32850 (theory,[1997Mo25](#)).
[1997Be70](#), [1995CzZZ](#): ¹⁰⁷Y produced and identified in Pb(²³⁸U,F), E=750 MeV/nucleon reaction, followed by separation of reaction products and time-of-flight measurements.

[2011Ni01](#): ¹⁰⁷Y nuclide produced in Be(²³⁸U,F) reactions at E=345 MeV/nucleon produced by the cascade operation of the RBIF complex of accelerators at RIKEN. Target=550 mg/cm². Identification of ¹⁰⁵Y made on the basis of magnetic rigidity, time-of-flight and energy loss. The separated nuclei were implanted in a nine-layer double-sided silicon-strip detector (DSSSD). Correlations were recorded between the heavy ions and β rays. The half-life of ¹⁰⁷Y isotope was measured from the correlated ion- β decay curves and maximum likelihood analysis technique. In the analysis of the decay curve, β -detection efficiency, background rate, daughter and granddaughter (including those populated in delayed neutron decays) half-lives, and β -delayed neutron emission probabilities were considered. Comparison of measured half-lives with FRDM+QRPA and KTUY+GT2 calculations.

[2015Lo04](#): ¹⁰⁷Y nuclide produced at RIBF-RIKEN facility in ⁹Be(²³⁸U,F) reaction at E=345 MeV/nucleon with an average intensity of 6×10¹⁰ ions/s. Identification of ¹⁰⁷Y was made by determining atomic Z and mass-to-charge ratio A/Q, where Q=charge state of the ions. The selectivity of ions was based on magnetic rigidity, time-of-flight and energy loss. The separated nuclei were implanted at a rate of 50 ions/s in a stack of eight double-sided silicon-strip detector (WAS3ABi), surrounded by EURICA array of 84 HPGe detectors. Correlations were recorded between the implanted ions and β rays. The half-life of ¹⁰⁷Y isotope was measured from the correlated ion- β decay curves and maximum likelihood analysis technique as described in [2014Xu07](#). Comparison of measured half-lives with FRDM+QRPA, KTUY+GT2 and DF3+CQRPA theoretical calculations.

[2013Fa05](#): calculated half-life, delayed neutron emission probability.

[2011Ro08](#): calculated levels, J, π , charge radius, S(2n), one-quasiproton configurations, quadrupole deformations.

¹⁰⁷Y Levels

E(level)	T _{1/2}	Comments
0	33.5 ms 30	$\% \beta^- = 100$; $\% \beta^- n = ?$; $\% \beta^- 2n = ?$ Theoretical $\% \beta^- n = 35.4$, $\% \beta^- 2n = 0.12$ (2003Mo09). E(level): measured half-life is assumed to correspond to the ground state of ¹⁰⁷ Y. J $^\pi$: 5/2 ⁺ from systematics (2012Au07) and theoretical considerations (1997Mo25). T _{1/2} : from 2015Lo04 (ion- β correlated curve) using maximum likelihood method. Other: 41 ms +15-9 (2011Ni01 , ion- β -correlated curve). Note that 2015Lo04 list uncertainty of 0.3 ms in their Table I, which seems a misprint in view of value plotted in their Fig. 2 and quoted uncertainties for other isotopes in Table I.