^{74}As β^- decay (17.77 d)

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, Ameenah R. Farhan	NDS 107, 1923 (2006)	30-Apr-2006

Parent: ^{74}As: E=0.0; $J^\pi=2^-$; $T_{1/2}$=17.77 d *2*; Q(β^-)=1352.8 *18*; %β^- decay=34 *2*

^{74}As-%β^- decay: Deduced from ratios of β^-, β^+ intensities (1958Gr02) and Iγ's of γ's to g.s. In both ^{74}Se and ^{75}Ge. Also see comments above.

Main references: 1976Ha61, 1972Va14, 1969Ha28, 1968Ku09.

γ and/or $\gamma\gamma$: 1976Ha61, 1972Va14, 1969Ha28, 1968Ku09. Others: 1975Ca37, 1972MoZD, 1970CoZU, 1969GuZV, 1968Da24, 1967Vi06, 1966St14, 1962Ei02, 1960Ya02, 1959Lo60, 1959Gi53, 1959Ho87, 1958Gr02, 1951Jo06, 1941De01.

$\gamma\gamma(\theta)$: 1975Ca37.

γ(pol,θ,t): 1972Ka35.

ce: 1958Gr02. α(K)exp from Ice(K)/Iβ ratio.

$T_{1/2}$ and production: 1976Ha61, 1972Em01, 1964St08, 1962Ei02 others: 1973ArZI, 1968Bo25, 1967Gl05, 1967De22, 1956Ru45, 1953Wa40, 1950Ho26, 1950Og11, 1950Me55, 1948Mo33, 1948Mc31, 1948Ho04, 1941De01, 1939Sa10, 1938Cu01.

^{74}Se Levels

E(level)	J^π[†]
0.0	0^+
634.78 *8*	2^+
1269.6 *6*	2^+

[†] From 'Adopted Levels'.

β^- radiations

β^- : 1958Gr02, 1971Bo01, 1968Va13, 1965He08, 1957Sc23, 1951Jo06, 1950Me55, 1942El04. For theoretical computations see 1972Ma72, 1970Ko20, 1970Ko06, 1960Ko06.

β^- spectra shapes: 1971Bo01, 1971De02 (theoretical analysis of results In 1971Bo01). Others: 1958Gr02, 1951Jo06.

(β^-)(θ): 1983PuZX, 1972MoZD, 1965Og04, 1964Si12, 1951Jo06.

(β^-)(θ)(circ pol): 1983PuZX.

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(83.2[‡] *19*)	1269.6	<0.04	>7.1	av Eβ=21.78 *53*

717.0 *20*	634.78	15.4 *11*	7.63 *4*	av Eβ=242.75 *72*
				E(decay): from 1971Bo01. Others: 1958Gr02, 1951Jo06, 1950Me55, 1942El04, 1972MoZD.
				Iβ(635 level)/Iβ(g.s.)=1.22 *10* (1958Gr02). Others: 1951Jo06, 1950Me55, 1942El04.
				spectral shape factors measured by 1971Bo01.
				for (717β)(635γ)(θ) see 1965Og04 where A_2 values are given.
				for (717β)(635γ)(CP) see 1983PuZX.

1350.1 *7*	0.0	18.6 *23*	9.37[1u] *6*	av Eβ=530.80 *78* E(decay): from 1971Bo01. Others: 1958Gr02, 1951Jo06, 1950Me55, 1942El04, 1972MoZD. Iβ measured by 1958Gr02. Others: 1951Jo06, 1950Me55, 1942El04. spectral shape factors suggest first-forbidden unique transition (1971Bo01). Others: 1958Gr02, 1951Jo06.

[†] Absolute intensity per 100 decays.

[‡] Existence of this branch is questionable.

^{74}As β^- decay (17.77 d) (continued)

$\gamma(^{74}Se)$

Iγ normalization: deduced from ratios of β^-, β^+ intensities (1958Gr02) and Iγ′s of γ′s to g.s. In both ^{74}Se and ^{75}Ge. Also see comments above.

The normalization of the decay scheme has been carried out by using Iγ′s of 596γ, 635γ, 1204γ and the following ratios of Iβ′s: I(1350β^-)/I(717β^-)=1.22 *10* (1958Gr02), I(1534β+)/I(941β+)=0.133 *28* (1958Gr02), I(1534β+)/I(717β^-)=0.24 *5* (1958Gr02), I(1534β+941β+)/I(596γ)=0.495 *30* (1969Ha28). For feeding to g.s. Iε/Iβ^+=0.82 (theory for 1U transition).

E_γ[†]	I_γ[‡#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	α[@]	Comments
634.78 *8*	25.8 *9*	634.78	2^+	0.0	0^+				α(K)exp=0.00137 *14* (1958Gr02).
635 *2*	≈0.06	1269.6	2^+	634.78	2^+	E2+M1	−2.6 *2*	0.00133 *1*	α=0.00133 *1*; α(K)=0.00117 *1*; α(L)=0.00012 γ reported by 1972Va14 and 1968Ku09. Iγ from γγ (1972Va14). (635γ)(634.78γ)(θ): A_2=0.21 *2*, A_4=0.27 *6* (1975Ca37). δ: from γγ(θ).
1269.6 *6*	0.0031 *10*	1269.6	2^+	0.0	0^+				γ reported by 1972Va14 only.

[†] Weighted averages of values from 1972Va14, 1969Ha28 and 1968Ku09.
[‡] Weighted averages of values from 1976Ha61, 1972Va14, 1969Ha28, and 1968Ku09.
[#] For absolute intensity per 100 decays, multiply by 0.60 *4*.
[@] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

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Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays