^{26}F IT decay (2.2 ms) 2013Le03

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia and A. M. Hurst	NDS 134, 1 (2016)	1-Feb-2016

Parent: ^{26}F: E=643.4 *1*; $J^{\pi}=4^+$; $T_{1/2}$=2.2 ms *1*; %IT decay=82 *11*

^{26}F-%IT decay: %IT=82 *11* (2013Le03). Note that uncertainty is listed as 14% in the abstract of the paper.

^{26}F was produced from fragmentation of a primary beam of ^{36}S, E=77.6 MeV/nucleon on a Be target (thickness 237 mg/cm^2), separated by LISE spectrometer at GANIL, identified from energy loss in a stack of Si detectors and time-of-flight, and implanted in a 1 mm-thick double-sided Si stripped (DSSSD) detector surrounded by four clover HPGe detectors. Measured Eγ, Iγ, $\beta\gamma$ and $\gamma\gamma$ coincidences, half-life of ^{26}F g.s. and isomer, %β^-n. Deduced levels, J, π. Comparison with Shell model calculations.

^{26}F Levels

E(level)	J^{π}	$T_{1/2}$	Comments
0.0	1^+		
643.4 *1*	4^+	2.2 ms *1*	%IT=82 *11*; %β^-=18 *11*; %β^-n=12 *8* %IT: from 2013Le03. May be considered an estimated value, since three decay modes of this isomeric state, i.e. IT, β^-, and β^-n, coupled with same decay product through β^-n decay branch of ^{26}F ground state make the measurements a challenge. Reported isomeric ratio R=42 *8*% in 2013Le03 may also be considered as an estimated value for aforementioned reasons. %β^-: From 100 − %IT. %β^-n: 65 *18*% of %β^-=18 *11* β- branch of 4^+ isomeric state (e-mail communication with A. Lepailleur ((1st author of 2013Le03): dated Sept 10, 2015). Note that 2013Le03 do not seem to provide explanation or methodology for the extraction of %β^-n decay mode with a relative value of 65% *18*. E(level): 2013Le03 state that the 643.4-keV, 4^+ isomer may correspond to the 657 keV *7*, 2^+ level reported in 2012St01 (Phys. Rev. C85, 017303), albeit with a weak confidence. In this scenario, the 657-keV, 4^+ isomer will decay via a 2^+ state of very low energy (up to 10 keV in consistency with Weisskopf lifetime estimates) and then by the 643.4γ to the 1^+ ground state. Further, 2013Le03 state that the energy of the isomer is ≈650 *10* keV. J^{π}: From shell model calculations in 2013Le03, assuming 643.4γ as a M3 transition to 1^+. If this excited level is considered to be the same as 657 keV *7* reported in 2012St01 (Phys. Rev. C85, 017303), the hypothesis of isomerism of 4^+ state would be due to the emission of a very low energy 4^+ to 2^+ transition (up to 10 keV to ensure having a long-lived isomer), then followed by 2^+ to 1^+ transition − noted in 2013Le03. $T_{1/2}$: From 643.4γ(t) (2013Le03).

γ(^{26}F)

Eγ	Iγ †‡	E$_i$(level)	J_i^{π}	E$_f$	J_f^{π}	Mult.
643.4 *1*	34 *2*	643.4	4^+	0.0	1^+	[M3]

† Absolute intensity per 100 ^{26}F decay − received from A. Lepailleur (1st author of 2013Le03) through e-mail communications (Sept 17, 2015).

‡ Absolute intensity per 100 decays.

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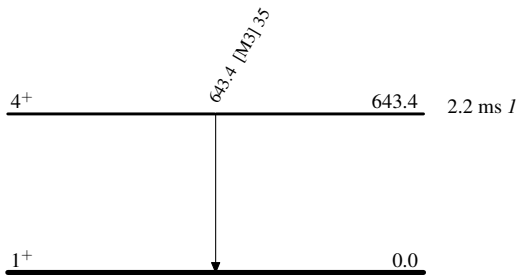
Decay Scheme

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

%IT=82 *11*



$^{26}_{9}F_{17}$