^{22}Na ε decay

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 127, 69(2015)	1-Apr-2015

Parent: ^{22}Na: E=0.0; $J^\pi=3^+$; $T_{1/2}$=2.6018 y *22*; Q(ε)=2843.20 *17*; %ε+%β^+ decay=100.0

Decay scheme from the Table de Radionuclides – CEA ISBN 2 *7272* 0200 *8*, except as noted. Produced by ^{19}F(α,n), ^{24}Mg(d,α).

Others: 2009Si18,2008Li02,2008Ru01,2006Li34,1983Ba41,1976Ma38, 1968Le03.

^{22}Ne Levels

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          KLL Auger electron data from 2007In06

The absolute energy of the KL2L3(1D)          Auger transition is
824.5 eV 19    relative to Fermi level. This energy is higher by about
20 eV compared to that obtained in experiments with free Ne atoms.

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Transitions        Relative energies     Relative intensities
                        (in eV)               (KLiLj/ΣKLL,%)
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KL1L1(1S)                 -56.0 2                 6.2 4
KL1L2(1P)                 -32.7 1                16.8 7
KL1L3(3P)                 -21.9 2                 6.8 5
KL2L2(1S)                  -4.3 5                 8.5 10
KL2L3(1D)                  0                     61.7 17
Unknown           +18.5 5                 2.8 5
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E(level)	J^π	$T_{1/2}$
0	0^+	stable
1274.53 *7*	2^+	

ε,β^+ radiations

E(decay)	E(level)	Iβ^+ †	Iε†	Log *ft*	I($\varepsilon+\beta^+$)†	Comments
(1568.67 *18*)	1274.53	89.90 *9*	10.04 *9*	7.41	99.944 *14*	av Eβ=216.012 *76*; εK=0.0927 *1*; εL=0.007674 *8*; εM+=0.0001076 *1* ε/β+=0.1071 *5*, weighted average of measured values: 0.1084 *27* (2009Na08), 0.1050 *29* (1990Ku11), 0.1075 *25* (1986Sy01), 0.1079 *3* (1983Ba41), 0.1128 *57* (1977Bo10); 0.1077 *6* (1976Ma38), 0.1042 *10* (1968We02), 0.1048 *7* (1967Le07), 0.1041 *10* (1964Wi04), 0.112 *4* (1959Ra09), and 0.110 *6* (1954Sh31). Theoretical value ε/β+=0.1152 *3* (1978Fi11). Note Iε/Iβ+=0.1064 *2*, Iε and Iβ+ obtainted using the Log *ft* code available at NNDC, BNL website.
(2843.20 *17*)	0	0.055 *14*	0.00098 *25*	14.92^{2u} *11*	0.056 *14*	av Eβ=835.46; εK=0.016146 *6*; εL=0.0013378 *5*; εM+=1.8761×10^{-5} *7* 1996Sa06 measured Iε=0.07 *2*.

† Absolute intensity per 100 decays.

^{22}Na ε decay (continued)

$\gamma(^{22}Ne)$

Iγ normalization: From ΣI(γ+ce) to (g.s.)=100.

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[‡]	Comments
1274.537 *7*	99.940 *14*	1274.53	2^+	0	0^+	E2	2.8×10^{-05} *3*	E_γ: From 2000He14. α: α(tot)=6.8×10^{-4}, from experimental value of 1985HaZA. Interpolated value is 6.8×10^{-6} from tables of 1976Ba63. Internal pair formation coefficient α_π=2.1×10^{-5} *3* (1979Sc31). α=α(tot)+α_π.

† Absolute intensity per 100 decays.

‡ 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.

^{22}Na ε decay

Decay Scheme

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