



1 Decay Scheme

Na-22 disintegrates predominantly to the 1275 keV level of Ne-22 . A very small fraction (0,056 %) disintegrates to the ground state of Ne-22.

Le Na-22 se désintègre essentiellement vers le niveau de 1275 keV de Ne-22 par émission bêta plus et capture électronique. Une faible proportion (0,056 %) se désintègre vers le niveau fondamental.

2 Nuclear Data

$$T_{1/2}({}^{22}\text{Na}) : 2,6029 \quad (8) \quad \text{a}$$

$$Q^+({}^{22}\text{Na}) : 2843,02 \quad (21) \quad \text{keV}$$

2.1 Electron Capture Transitions

	Energy keV	Probability × 100	Nature	lg <i>ft</i>	<i>P_K</i>	<i>P_L</i>
ε _{0,1}	1568,44 (21)	9,64 (9)	Allowed	7,41	0,923 (4)	0,077 (4)
ε _{0,0}	2843,02 (21)	0,00098 (25)	Unique 2nd Forbidden	14,91		

2.2 β⁺ Transitions

	Energy keV	Probability × 100	Nature	lg <i>ft</i>
β _{0,1} ⁺	546,44 (21)	90,30 (9)	Allowed	7,4
β _{0,0} ⁺	1821,02 (21)	0,055 (14)	Unique 2nd Forbidden	14,9

2.3 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ $\times 100$	Multipolarity	α_K (10^{-6})	α_T (10^{-6})	α_π (10^{-5})
$\gamma_{1,0}(\text{Ne})$	1274,577 (7)	99,94 (13)	E2	6,36 (9)	6,71 (9)	2,34 (3)

3 Atomic Data

3.1 Ne

ω_K	:	0,0152	(8)
$\bar{\omega}_L$:	0,0001	(1)
n_{KL}	:	1,985	(6)

3.1.1 X Radiations

	Energy keV	Relative probability
X_K	$K\alpha_2$	0,8486
	$K\alpha_1$	0,8486

3.1.2 Auger Electrons

	Energy keV	Relative probability
Auger K		
KLL	0,75 – 0,81	

4 Electron Emissions

		Energy keV		Electrons per 100 disint.
e_{AK}	(Ne)			8,8 (1)
	KLL	0,75	- 0,81	}
$ec_{1,0 \alpha}$	(Ne)	252		
$\beta_{0,0}^+$	max:	1821,02	(21)	0,055 (14)
$\beta_{0,0}^+$	avg:	835,04	(19)	
$\beta_{0,1}^+$	max:	546,44	(21)	90,30 (9)
$\beta_{0,1}^+$	avg:	215,62	(17)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV		Photons per 100 disint.
$XK\alpha_2$	(Ne)	0,8486	0,0453 (25)	} $K\alpha$
$XK\alpha_1$	(Ne)	0,8486	0,090 (5)	

5.2 Gamma Emissions

		Energy keV		Photons per 100 disint.
γ^\pm		511	180,7 (2)	
$\gamma_{1,0(Ne)}$		1274,537 (7)	99,94 (13)	

6 Main Production Modes

F – $^{19}(\alpha,n)\text{Na} - 22$

Mg – $^{24}(d,\alpha)\text{Na} - 22$

7 References

- B. T. WRIGHT. Phys. Rev. 90 (1953) 159
(Beta plus emission probabilities)
- W.E.KREGER. Phys. Rev. 96 (1954) 1554
(Electron Capture/Beta plus ratio)
- R.SHERR, R.H.MILLER. Phys. Rev. 93 (1954) 1076
(Electron Capture/Beta plus ratio)
- P.F.ZWEIFEL. Phys. Rev. 96 (1954) 1572
(Electron Capture/Beta plus ratio)
- R.A.ALLEN, W.E.BURCHAM, K.F.CHAKETT, G.L.MUNDAY, P.REASBECK. Proc. Phys. Soc. 68 (1955) 681
(Electron Capture/Beta plus ratio)
- W.F.MERRIT, P.J.CAMPION, R.C.HAWKINGS. Can. J. Phys. 35 (1957) 16
(Half-life)
- J.KÖNIG, B.VAN NOOIJEN, H.L.HAGEDOORN, A.H.WAPSTRA. Nucl. Phys. 9 (1958) 296
(Electron Capture/Beta plus ratio)
- M.K.RAMASWAMY. Indian J. Phys. 33 (1959) 285
(Electron Capture/Beta plus ratio)
- E. I. WYATT, S. A. REYNOLDS, T. H. HANDLEY, W. S. LYON, H. A. PARKER. Nucl. Sci. Eng. 11 (1961) 74
(Half-life)
- A.WILLIAMS. Nucl. Phys. 52 (1964) 324
(Electron Capture/Beta plus ratio)
- S. C. ANSPACH, L. M. CAVALLO, S. B. GARFINKEL, J. M. R. HUTCHINSON, C. N. SMITH. Report NP-15663 (1965)
(Half-life)
- H. LEUTZ, H. WENNINGER. Nucl. Phys. A99 (1967) 55
(Electron Capture/Beta Plus Ratio)
- E.VATAI, D.VARGA, J.UCHRIN. Nucl. Phys. A116 (1968) 637
(Electron Capture/Beta plus ratio)
- M.F.MCCANN, K.M.SMITH. J. Phys. (London) A2 (1969) 392
(Electron Capture/Beta plus ratio)
- E. K. WARBURTON, G. T. GARVEY, I. S. TOWNER. Ann. Phys. 57 (1970) 174
(Beta plus emission probabilities)
- J. S. MERRITT, J. V. G. TAYLOR. Report AECL-3912 (1971)
(Electron Capture/Beta Plus Ratio)
- J. KANTELE, M. VALKONEN. Nucl. Instrum. Methods 112 (1973) 501
(Gamma emission probabilities)
- T. D. MACMAHON, A. P. BAERG. Can. J. Phys. 54 (1976) 1433
(Electron Capture/Beta Plus Ratio)
- H. E. BOSCH, J. DAVIDSON, M. DAVIDSON, L. SZBISZ. Z. Phys. A280 (1977) 321
(Electron Capture/Beta Plus Ratio)
- W.BAMBYNEK, H.BEHRENS, M.H.CHEN, B.CRASEMANN, M.L.FITZPATRICK, K.W.D.LEDINGHAM, H.GENZ, M.MUTTERER, R.L.INTERMANN. Rev. Mod. Phys. 49 (1977) 77
(Electron Capture/Beta plus ratio)
- R.B.FIRESTONE, W.M.C.McHARRIS, B.R.HOLSTEIN. Phys. Rev. C18 (1978) 2719
(Electron Capture/Beta plus ratio)
- P.SCHLUTER, G.SOFF. At. Data Nucl. Data Tables 24 (1979) 509
(Internal-pair formation coefficient)
- H. HOUTERMANN, O. MILOSEVICH, F. REICHEL. Int. J. Appl. Radiat. Isotop. 31 (1980) 151
(Half-life)
- A. R. RUTLEDGE, L. V. SMITH, J. S. MERRITT. Report NBS-SP-626 (1982) 5
(Half-life)
- A. P. BAERG. Can. J. Phys. 61 (1983) 1222
(Electron Capture/Beta Plus Ratio)
- H.H.HANSEN. Nuc. Sci. Technol. 6 (1985) 777
(K ICC, T ICC)
- V.KUNZE, W.D.SCHMIDT-OTT, H.BEHRENS. Z. Physik A337 (1990) 169
(Electron Capture/Beta plus ratio)
- W. BAMBYNEK, T. BARTA, R. JEDLOVSKY, P. CHRISTMAS, N. COURSOL, K. DEBERTIN, R. G. HELMER, A. L. NICHOLS, F. J. SCHIMA, Y. YOSHIZAWA. Report IAEA-TECDOC 619 (1991)
(Half-life and Gamma emission probability evaluations)

- E. SCHÖNFELD. Report PTB 6.33-95-2 (1995)
(PK, PL, PM theory)
- E. SCHÖNFELD, H. JANSSEN. Nucl. Instrum. Methods A369 (1996) 527
(K, L, Auger electron emission probabilities)
- M.-M.BÉ, B.DUCHEMIN, E.BROWNE, S.-C.WU, V.CHECHEV, R.HELMER, E.SCHÖNFELD. CEA-ISBN 2-7272-0211-3 1 (1999)
(Evaluation)
- M.-M.BÉ, B.DUCHEMIN, E.BROWNE, S.-C.WU, V.CHECHEV, R.HELMER, E. SCHÖNFELD. CEA-ISBN 2-7272-0200-8 (1999)
(Evaluation)
- R. G. HELMER, C. VAN DER LEUN,. Nucl. Instrum. Methods A450 (2000) 35
(Gamma ray energies)
- M. P. UNTERWEGER. Appl. Rad. Isotopes 56 (2002) 125
(Half-life)
- I.M.BAND, M.B.TRZHASKOVSKAYA, C.W.JR.NESTOR. At. Data Nucl. Data Tables 81 (2002) 1
(Theoretical ICC)
- M.MUKHERJEE, , A.KELLERBAUER, D.BECK, K.BLAUM, G.BOLLEN, F.CARREL, P.DELAHAYE, J.DILLING, S.GEORGE, C.GUENAUT, F.HERFURTH, A.HERLERT, H.-J.KLUGE, U.KOSTER, D.LUNNEY, S.SCHWARZ, L.SCHWEIKHARD, C.YAZIDJIAN.. Phys. Rev. Lett. 93 (2004) 150801
(Na mass excess)
- O.NÄHLE, K.KOSSERT, R.KLEIN. Appl. Rad. Isotopes 66 (2008) 865
(Electron Capture/Beta plus ratio)
- M.MUKHERJEE, D. BECK, K. BLAUM, G. BOLLEN, P. DELAHAYE, J. DILLING, S. GEORGE, C. GUENAUT, F. HERFURTH, A. HERLERT, A. KELLERBAUER, H.-J. KLUGE, U. KOSTER, D. LUNNEY, S. SCHWARZ, L. SCHWEIKHARD, C. YAZIDJIAN. Eur. Phys. J. A35 (2008) 31
(Na mass excess)
- G. AUDI, W.MENG, D. LUNNEY, B. PFEIFFER. Priv. Comm. (2009)
(Mass excess)

