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ISOTOPIC MASSES

A Guide to the Literature

Bonnie E. Cushman
January, 1954

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Berkeley, California

ISOTOPIC MASSES

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January, 1954

The mass data compiled here are recent values, obtained in most cases with improved mass-measuring instruments or with newly determined Q values. They are intended for local use pending issue of similar tables being prepared by authorities in the field. The period covered is roughly 1950 through 1953, although material from a few earlier papers has been cited.

For each isotope the mass computed in NP-1980 from Fermi's semi-empirical formula is given for comparison between the theoretical and experimental work (NP-1980, "Table of Atomic Masses," by N. Metropolis and G. Reitweisner, March 1950). An asterisk (*) following a mass value indicates that I recast the published data into terms of atomic mass units. The nuclear reactions or mass spectrographic doublets studied and the masses of the reference isotopes used in each determination are listed with the resultant mass value.

The bibliography is composed of two sections; Part I consists of those papers cited in the main body of the report, and Part II includes some additional papers of interest in the study of isotopic mass determinations.

The compilation is not a list of best values. A series of consistent values does not necessarily mean accuracy, because of errors inherent in the measuring instrument. However, improvements in measuring techniques have brought better agreement among the results found at the different laboratories, and for this reason I have concerned myself primarily with data obtained within the past few years. Furthermore, I have assumed that the paper most recently published by an investigator presents his most accurate work. This report must therefore be considered only a guide, not an authority, in the field of atomic masses. I will appreciate your comments and notification of errors and omissions.

Grateful acknowledgment is made to Drs. G. T. Seaborg, R. A. Glass and S. G. Thompson for providing me with mass data in the heavy element region prior to the publication of their article in the Journal of the American Chemical Society.

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_0n^1$	Q-Value	1.0089383±57	n - H = -(2H - D) - Q_γ	(2H - D) = 0.0015380±21 - Q_γ = 0.0023479±45 H = 1.0081283±28	K. T. Bainbridge NYO-849, June, 1948
		1.008981±3	H_2 -D = E(D) - (n - H) = 0.001553±5		H. E. Ewald Z. Naturforsch, 6a, 293 (1951)
		1.008982±3	n (β^-) H	H = 1.008142±3	C. W. Li, et al Phys. Rev. 83, 512 (1951)
		1.0090087±56	H_2 -D D binding energy	H = 1.0081686±52	T. R. Roberts Phys. Rev. 81, 624 (1951)
	Mass Spectra and Q-Value	1.0089785±38	(2H - D) from Q-values (a) 2H - D from Mass Spectra (b)	(a) = 0.001555±6 (b) = 0.001549±6 H = 1.0081386±32 D = 2.0147252±57	K. T. Bainbridge Phys. Rev. 81, 146-47 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_1H^1$	Fermi Formula	1.02845±3			N. Metropolis and G. Reitweisner NP-1980, March (1950)
	Q-Value	1.008142±3	n (β^-) H H (n, γ) D D (γ, n) H D (p, n) 2H	n = 1.008982± 3 D = 2.014735± 6 C = 12.003804±17	C. W. Li, et al Phys. Rev. 83, 512 (1951)
		1.008146±3	D (γ, n) H	D = 2.014740± 4	A. H. Wapstra Phys. Rev. 82, 756 (1951)
	Mass Spectra	1.008141±2	H_2 - D CH_4 - 0 CH_2 - N^{14}	D = 2.014732± 4 C = 12.003807±11 N^{14} = 14.007525±15	H. Ewald Z. Naturforsch. 6a, 293 (1951)
		1.008145±2	H_2 - D	D = 2.014741± 3	K. Ogata and H. Matsuda, Phys. Rev. 89, 27 (1953)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_1H^1$					
	Mass Spectra	1.008146± 3	$C_3H_8 - CO_2$	$C^{12} = 12.003842 \pm 4$	T. L. Collins, et al Phys. Rev. 84, 717 (1951)
			$(N^{14})_2 - C^{12}O^{16}$	$\Delta m = 0.0112372 \pm 21$	L. G. Smith and C. C. Damm Phys. Rev. 90, 324 (1953)
			$(C^{12})_2 \quad (H)_4 \quad - (N^{14})_2$	0.0251493 ± 41	
			$(C^{12})_2 \quad (H)_4 \quad - C^{12}O^{16}$	0.0363877 ± 41	
			$(C^{12})_2 \quad (H)_6 \quad - N^{14}O^{16}$	0.0489623 ± 55	
	Mass Spectra and Q-Values	1.0081386±32	$H_2 - D^2$	$D = 2.0147252 \pm 57$	K. T. Bainbridge, Phys. Rev. 81, 146 (1951)
			$C^{12}H_4 - O^{16}$	$C = 12.003895 \pm 19$	
		1.0081283±28	$H_2 - D$	$D = 2.0147186 \pm 55$	K. T. Bainbridge, NYO-849, June 1948
			$3D - 1/2\ C$	$C = 12.003856 \pm 19$	
			$CH_4 - O$		

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_1D^2$	Fermi Formula	2.03109			
	Q-Value	2.014735±6	H (n, γ) D D (γ, n) H D (p, n) 2H D (n, γ) H^3 D (d, n) He^3 D (d, p) H^3	H = 1.008142± 3 H^3 = 3.016997± 11 He^3 = 3.016977± 11 C = 12.003804± 17	C. W. Li, et al Phys. Rev. 83, 512 (1951)
		2.014740±4	D (γ, n) H	H = 1.008146± 3	A. H. Wapstra Phys. Rev. 82, 756 (1951)
	Q-Value and Mass Spectra	2.0147186±55	D - 2H 3D - 1/2 C CH_4 - O	H = 1.0081283±28 C = 12.003856 ±19	K. T. Bainbridge NYO-849, June 1948
		2.0147252±57	2D - He^4 H_2 - D D_3 - 1/2 C	H = 1.0081386±32 He^4 = 4.003842 ±13 C = 12.003895 ±19	K. T. Bainbridge Phys. Rev. 81, 146 (1952)
	Mass Spectra	2.014732± 4	H_2 - D D_3 - 1/2 C	H = 1.008141 ± 2 C = 12.003807 ±11	H. Ewald Z. Naturforsch. 6a, 293 (1951)
		2.014740± 6	H_2 - D	H = 1.008146 ± 3	T. L. Collins, et al Phys. Rev. 84, 717 (1951)
		2.014741± 3	H_2 - D D_3 - 1/2 C	H = 1.008145 ± 2 C = 12.003844 ± 6	K. Ogata and H. Matsuda Phys. Rev. 89, 27 (1953)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_1T^3$	Fermi Formula	3.01733			
	Q-Value	3.016997±11	D (n, γ) H^3 D (d, p) H^3 H^3 (β^-) He^3 H^3 (p, n) He^3 He^3 (n, p) H^3	H = 1.008142± 3 D = 2.014735± 6 He^3 = 3.016977± 11 C = 12.003804± 17	C. W. Li et al Phys. Rev. 83, 512 (1951)
		3.017029±33 + neutrino	D (d, p) T^3 Li^6 (n, α) T^3 T^3 = He^3 + β Li^6 (p, α) He^3	D = 2.0147186±55 He^3 = 3.017016 ±32	K. T. Bainbridge NYO-849, June 1948
$_2He^3$	Fermi Formula	3.01782			
	Q-Value	3.016977±11	D (d, n) He^3 H^3 (β^-) He^3 H^3 (p, n) He^3 He^3 (n, p) H^3 Li^6 (p, α) He^3	H = 1.008142± 3 D = 2.014735± 6 T = 3.016997± 11 Li^6 = 6.017021± 22 C = 12.003804± 17	C. W. Li et al Phys. Rev. 83, 512 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_2He^3$	Q-Value	3.017016±32	Li^6 (p, α) He^3 D^2 (d, n) He^3 $T^3 = He^3 + \beta$	D = 2.0147186±55 T = 3.017029 ±33	K. T. Bainbridge NYO-849, June 1948
$_2He^4$	Fermi Formula	3.99807			
	Q-Values	4.003865± 7	2 cycles involving (d, α), (p, α), (d, p) and α decay in light masses	$He^4 = (1/7)(O^{16}+6D^2 - \Sigma Q)$ $He^4 = (1/6)(O^{16}+4D^2 - \Sigma Q)$ $D^2 = 2.014723 \pm 5$	E. N. Strait et al Phys. Rev. 81, 747 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_2He^4$	Q-Values	4.003865± 7	O^{16} (d, α) N^{14}	O^{16} (d, α) N^{14}	
			N^{14} (d, p) N^{15}	N^{14} (d, p) N^{15}	
			N^{15} (d, α) C^{13}	N^{15} (d, α) C^{13}	
			C^{13} (d, α) B^{11}	C^{13} (d, α) B^{11}	
			B^{11} (d, α) Be^9	B^{11} (p, α) Be^8	
			Be^9 (d, α) Li^7	Be^8 (α) α	
			Li^7 (p, α) α		
		$He^4 = (1/7)(O^{16} + 6D^2 - \Sigma Q)$		He^4 $(1/6)(O^{16} + 4D^2 - \Sigma Q)$	
				H = 1.008142± 3	C. W. Li, et al Phys. Rev. 83, 512, (1951)
		4.003873±15	Li^7 (p, α) α	Li^7 = 7.018223± 26	
			Be^8 (α) α	Be^8 = 8.025018± 30	
				C = 12.003804± 17	
	Mass Spectra	4.003860±12	D_2 - He^4	D = 2.014732± 4	H. Ewald Z. Naturforsch, 6a, 293 (1951)
		4.003944±19	D_2 - He^4	D = 2.014778± 8 (Old Value)	A. O. Nier and T. R. Roberts Phys. Rev. 81, 624 (1951)
	Mass Spectra and Q-Values	4.003842±13	D_2 - He^4	D = 2.0147252±57	K. T. Bainbridge Phys. Rev. 81, 146 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses		References
$_2He^4$						
	Mass Spectra and Q-Valves	4.003880±30	$Li^6(d, \alpha) He^4$	H	= 1.0081283±28	K. T. Bainbridge NYO-849, June (1948)
			$Li^7(p, \alpha) He^4$	D	= 2.0147186±55	
			$Be^9(p, \alpha) Li^6$			
			$Be^9(d, \alpha) Li^7$	Li^7	= 7.01820±10	
			$Be^9(p, d) Be^8$			
			$B''(p, \alpha) Be^8$	Be^9	= 9.01506±20	
			$B^{10}(d, \alpha) Be^8$	B^{10}	=10.01616±13	
			$B^{11}(d, \alpha) Be^9$	B^{11}	=11.01287±10	
			$2D^2 - He^4$	C^{12}	=12.003856±19	
			$2He^4 - 1/2O^{16}$			
			$Be^8 = 2He^4 + Q\left[\begin{matrix} Li^6(d, \alpha) He^4 + Be^9(p, \alpha) Li^6 \\ Li^7(p, \alpha) He^4 + Be^9(d, \alpha) Li^7 \end{matrix}\right] - Q\left[Be^9(p,d)Be^8\right] - (D_2^2 - He^4)$			
						weighted ave.
$_2He^6$						
	Fermi Formula	6.01377				
	Q-Value	6.020833±39	$Li^7(t, \alpha)He^6$	H	= 1.008142± 3	C. W. Li Phys. Rev. 88 1038 (1952)
				Li^7	= 7.018223±26	
				C	=12.003804±17	

	Method	Mass	Reaction or Doublet	Reference Masses		References
$_3Li^6$						
	Fermi Formula	6.01963				
	Q-Value	6.017021±22	He^6 (β^-) Li^6	H	= 1.008142± 3	C. W. Li, et al Phys. Rev. 83, 512 (1951)
			Li^6 (p, α)He^3	He^3	= 3.016977±11	
				He^6	= 6.020474±27	
			Li^6 (d, p)Li^7	Li^7	= 7.018223±26	
			Be^9 (p, α)Li^6	Be^9	= 9.015043±30	
				C	=12.003804±17	
$_3Li^7$						
	Fermi Formula	7.01194				
	Q-Value	7.018223±26	Li^6 (d, p) Li^7	H	= 1.008142± 3	C. W. Li, et al Phys. Rev. 83, 512 (1951)
			Li^7 (p, n) Be^7	He^4	= 4.003873±15	
			Li^7 (p, α) α	Li^6	= 6.017021±22	
				Be^7	= 7.019150±26	
			Li^7 (d, p) Li^8	Li^8	= 8.025018±30	
			Be^9 (d, α) Li^7	Be^9	= 9.015043±30	
			B^{10} (n, α) Li^7	B^{10}	=10.016114±28	
				C	=12.003804±17	
	Q-Value and Mass Spectra	7.01820±10	$Li^7 - \frac{1}{2} N^{14}$	N^{14}	=14.007536±22	K. T. Bainbridge NYO-849 June (1948)

	Method	Mass	Reaction or Doublet	Reference Masses		References
$_3Li^8$						
	Fermi Formula	8.02545				
	Q-Value	8.025018±30	$Li^7(d,p)\,Li^8$	H	= 1.008142± 3	C. W. Li, et al Phys. Rev. 83, 512 (1951)
				Li^7	= 7.018223±26	
				C	=12.003804±17	
$_4Be^7$						
	Fermi Formula	7.01342				
	Q-Value	7.019150±26	$Li^7(p,n)\,Be^7$	H	= 1.008142± 3	C. W. Li, et al Phys. Rev. 83, 512 (1951)
				Li^7	= 7.018223±26	
			$B^{10}(p,\alpha)\,Be^7$	B^{10}	=10.016114±28	
				C	=12.003804±17	
$_4Be^8$						
	Fermi Formula	8.00132				

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_4Be^8$					
	Q-Value	8.007850±29	Be^8 (α) α	H = 1.008142± 3	C. W. Li, et al Phys. Rev. 83, 512 (1951)
			Be^9 (γ, n)Be^8	He^4 = 4.003873±15	
			Be^9 (p, d)Be^8	Be^9 = 9.015043±30	
			Be^9(d, t)Be^8	Be^{11} =11.012789±23	
			B^{11}(p, α)Be^8	C^{12} =12.003804±17	
$_4Be^9$					
	Fermi Formula	9.00947			
	Q-Value	9.015043±30	Be^9 (γ, n) Be^8	H = 1.008142± 3	C. W. Li, et al Phys. Rev. 83, 512 (1951)
			Be^9 (n, γ) Be^{10}	Li^6 = 6.017021±22	
			Be^9 (p, n) B^9	Li^7 = 7.018223±26	
			Be^9 (p, d) Be^8	Be^8 = 8.007850±29	
			Be^9 (d, t) Be^8	Be^{10} =10.016711±28	
			Be^9 (d, p) Be^{10}	B^9 = 9.016190±31	
			Be^9 (p, α) Li^6	B^{11} =11.012789±23	
			Be^9 (d, α) Li^7	C^{12} =12.003804±17	
			B^{11} (d, α) Be^9		

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_4Be^9$	Q-Value and Mass Spectra	9.01506±20	Be^9H - 1/2 Ne^{20} Be^9H - B^{10}	H = 1.0081283±28 B^{10} =10.01616±13 Ne^{20}=19.99872±13	K. T. Bainbridge NYO-849 June, (1948)
$_4Be^{10}$	Fermi Formula	10.00719			
	Q-Value	10.016711±28	Be^9 (γ, n) Be^{10} Be^9 (d, p) Be^{10} Be^{10} (β^-) B^{10}	H = 1.008142±3 Be^9 = 9.015043±30 B^{10} =10.016114±28 C =12.003804±17	C. W. Li, et al Phys. Rev. 83, 512 (1951)
$_5B^9$	Fermi Formula	9.01137			
	Q-Value	9.016190±31	Be^9(p, n) B^9	H = 1.008142± 3 Be^9 = 9.015043±30 C =12.003804±17	C. W. Li, et al Phys. Rev. 83, 512 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_5B^{10}$	Fermi Formula	10.01350			
	Q-Value	10.016114±28	Be^{10} (β^-) B^{10} B^{10} (n, α) Li^7 B^{10} (p, α) Be^7 B^{10} (d, p) B^{11}	H = 1.008142± 3 Li^7 = 7.018223±26 Be^7 = 7.019150±26 Be^{10} =10.016711±28 B^{11} =11.012789±23 C =12.003804±17	C. W. Li, et al Phys. Rev. 83, 512 (1951)
	Mass Spectra	10.016110±10	B^{10} - 1/2 Ne^{20} $B^{10}D^2$ - C^{12}	D = 2.014741± 3 C = 12.003844± 6 Ne^{20} = 19.998772±13	K. Ogata and H. Matsuda Phys. Rev. 89, 27 (1953)
	Q-Value and Mass Spectra	10.01616±13	Be^9H - B^{10} B^{10} - 1/2 Ne^{20}	H = 1.0081283±28 Be^9 = 9.01506±20 Ne^{20} = 19.99872±13	K. T. Bainbridge NYO-849, June (1948)

	Method	Mass	Reaction or Doublet	Reference Masses		References
$_5B^{11}$	Fermi Formula	11.00692				
	Q-Value	11.012789±23	$B^{10}(d, p) B^{11}$	H	= 1.008142± 3	C. W. Li, et al Phys. Rev. 83, 512 (1951)
			$B^{11}(p, n) C^{11}$	Be^8	= 8.007850±29	
			$B^{11}(p, \alpha) Be^8$	Be^9	= 9.015043±30	
			$B^{11}(\alpha, p) B^{12}$	B^{10}	=10.016114±28	
			$B^{11}(d, \alpha) Be^9$	B^{12}	=12.018162±22	
			$C^{13}(d, \alpha) B^{11}$	C^{11}	=11.014916±24	
				C^{12}	=12.003804±17	
				C^{13}	=13.007473±14	
	Mass Spectra	11.012811±9	$B^{10}H^1 - B^{11}$	H	= 1.008145± 2	K. Ogata and H. Matsuda Phys. Rev. 89, 27 (1953)
			$B^{11}H^1 - C^{12}$	B^{10}	=10.016110±10	
				C^{12}	=12.003844± 6	
	Mass Spectra and Q-Value	11.01287±10	$B^{11}H - C^{12}$	H	= 1.0081283±28	K. T. Bainbridge NYO-849, June (1948)
				C^{12}	=12.003856 ±19	

	Method	Mass	Reaction or Doublet	Reference Masses		References
$_5B^{12}$	Fermi Formula	12.01535				
	Q-Value	12.018162±22	$B^{11}(d,p)B^{12}$	H B^{11} C	= 1.008142± 3 =11.012789±23 =12.003804±17	C. W. Li, et al Phys. Rev. 83, 512 (1951)
$_6C^{11}$	Fermi Formula	11.00921				
	Q-Value	11.014916±24	$B^{11}(p,n)C^{11}$	H B^{11} C	= 1.008142± 3 =11.012789±23 =12.003804±17	C. W. Li, et al Phys. Rev. 83, 512 (1951)
$_6C^{12}$	Fermi Formula	11.99947				
	Q-Value	12.003804±17	$C^{12}(n,\gamma)C^{13}$ $C^{12}(d,n)N^{13}$ $C^{12}(d,p)C^{13}$ $C^{13}(d,t)C^{12}$ $N^{15}(p,\alpha)C^{12}$	H C^{13} N^{13} N^{15}	= 1.008142± 3 =13.007473±14 =13.009858±14 =15.004863±12	C. W. Li, et al Phys. Rev. 83, 512 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_6C^{12}$	Q-Value	12.003807±19	D (γ, n) H C^{12} (d, n) N^{13} O^{16} (d, α) N^{14} C^{13} (p, n) N^{13} C^{13} (d, p) C^{14} C^{14} (β^-) N^{14}	H = 1.008146± 3 D = 2.014740± 4	A. H. Wapstra Phys. Rev. 82, 756, (1951)
	Mass Spectra	12.003807±11	D_3 - 1/2 C^{12} CH_4 - O CH_2 - N^{14} CO - Si^{28}	H = 1.008141± 2 D = 2.014732± 4 N^{14} = 14.007525± 15 Si^{28} = 27.985792± 32	H. Ewald Z. Naturforsch 6a 293 (1951)
		12.003842± 4	C_4 - SO O_2 - S^{32} CO_2 - CS C_3H_8 - CO_2	H = 1.008146± 3 S^{32} = 31.982236± 7	T. L. Collins, et al Phys. Rev. 84, 717 (1951)

Method	Mass	Reaction or Doublet	Reference Masses	References
$_6C^{12}$				
	12.003844± 6 (weighted avg. of the four following values)			
	12.003840± 8	H_2 - D	H = 1.008145± 2	K. Ogata and H. Matsuda Phys. Rev. 89, 27 (1953)
		D_3 - 1/2 C^{12}	D = 2.014741± 3	
		$C^{12}H$ - O		
	12.003849± 6	O^{16} - S^{32}		
		C_4^{12} - $S^{32}O^{16}$	S^{32} =31.982274± 8	
	12.003829±27	B^{10} -1/2 Ne^{20}	D = 2.0147241±3	
		D_2O - Ne^{20}	B^{10} =10.016110±10	
		$B^{10}D$ - C^{12}	Ne^{20} =19.998772±13	
		D_3 - 1/2 C^{12}		
	12.003827±15	D_2O - 1/2 A^{40}	H = 1.008145± 2	
		$C_3^{12}H_4$ - A^{40}	D = 2.014741± 3	
		D_3 - 1/2 C^{12}	A^{40} =39.975148±24	
		H_2 - D		

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_6C^{12}$	Mass Spectra		$(N^{14})_2 - C^{12}O^{16}$	0.0112372±21	Lincoln G. Smith and C. C. Damm Phys. Rev. 90, 324 (1953)
			$(C^{12})_2\ (H^1)_4 - (N^{14})_2$	0.0251493±41	
			$(C^{12})_2\ (H^1)_4 - C^{12}O^{16}$	0.0363877±41	
			$(C^{12})_2\ (H^1)_6 - N^{14}O^{16}$	0.0489623±55	
	Q-Valve and Mass Spectra	12.003856±19	$H_2 - D$ $D_3 - 1/2\ C^{12}$ $C^{12}H_4 - O$	H = 1.0081283±28 D = 2.0147186±55	K. T. Bainbridge NYO-849 June, 1948
		12.003895±19	$D_3 - 1/2\ C^{12}$ $C^{12}H_4 - O$	H = 1.0081386±32 D = 2.0147252±57	K. T. Bainbridge Phys. Rev. 81, 146 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses		References
$_6C^{13}$						
	Fermi Formula	13.00430				
	Q-Value	13.007473±14	N^{15} (d, α) C^{13}	H	= 1.008142± 3	C. W. Li, et al Phys. Rev. 83, 512 (1951)
			C^{12} (n, γ) C^{13}	B^{11}	=11.012789±23	
			C^{12} (d, p) C^{13}	C^{12}	=12.003804±17	
			C^{13} (p, n) N^{13}	C^{14}	=14.007682±11	
			C^{13} (d, p) C^{14}	N^{13}	=13.009858±14	
			C^{13} (d, t) C^{12}	N^{15}	=15.004863±12	
			C^{13} (d, α) B^{11}			
			N^{13} (β^+) C^{13}			
	Mass Spectra	13.007505±12	$C^{12}_3 H^1_3$ - $C^{12}C^{13}H^1$ [sic]	H	= 1.008145± 2	K. Ogata and H. Matsuda Phys. Rev. 89, 27 (1953)
			$C^{13}O^{16}$ - Si^{29}	B^{10}	=10.016110±10	
			$B^{10}F^{19}$ - $C^{13}O^{16}$	C^{12}	=12.003844± 6	
				F^{19}	=19.004444±22	
				Si^{29}	=28.985705±21	
		13.007538±14	$C^{12}H^1$ - C^{13}	H	= 1.008141± 2	An old measurement considered doubtful by author. H. Ewald, Z. Naturforsch, 6a 293 (1951)
				C^{12}	=12.003807±11	

	Method	Mass	Reaction or Doublet	Reference Masses		References
$_6C^{14}$						
	Fermi Formula	14.00124				
	Q-Value	14.007682±11	C^{13} (d, p) C^{14}	H	= 1.008142± 3	C. W. Li, et al Phys. Rev. 83, 512 (1951)
			C^{14} (p, n) N^{14}	C^{12}	=12.003804±17	
			C^{14} (β^-) N^{14}	C^{13}	=13.007473±14	
			N^{14} (n, p) C^{14}	N^{14}	=14.007515±11	
$_7N^{13}$						
	Fermi Formula	13.00696				
	Q-Value	13.009858±14	C^{12} (d, n) N^{13}	H	= 1.008142± 3	C. W. Li, et al Phys. Rev. 83, 512 (1951)
			C^{13} (p, n) N^{13}	C^{12}	=12.003804±17	
			N^{13} (β^+) C^{13}	C^{13}	=13.007473±14	

	Method	Mass	Reaction or Doublet	Reference Masses		References
$_7N^{14}$						
	Fermi Formula	14.00783				
	Q-Value	14.007515±11	C^{14} (β^-) N^{14}	H	= 1.008142± 3	C. W. Li, et al Phys. Rev. 83, 512 (1951)
			C^{14} (p, n) N^{14}	C^{12}	=12.003804±17	
			N^{14} (n, p) C^{14}	C^{14}	=14.007682±11	
			N^{14} (n, γ) N^{15}	N^{15}	=15.004863±12	
			N^{14} (d, p) N^{15}			
			O^{16} (d, α) N^{14}			
	Mass Spectra	14.007525±15	$C^{12}H_2$ - N^{14}	H	= 1.008141± 2	H. Ewald Z. Naturforsch 6a, 293 (1951)
				C	=12.003807±11	
		14.007544±10	N_2^{14} - $C^{12}O$	H	= 1.0081686±52	T. R. Roberts Phys. Rev. 81, 624 (1951)
			$C^{12}H_2$ - N^{14}	C	=12.003803±13	
		14.007550± 5	$C^{12}H_2^1$ - N^{14}	H	= 1.008145± 2	K. Ogata and H. Matsuda Phys. Rev. 89, 27 (1953)
			$C_2^{12}H_4^1$ - N_2^{14}	C	=12.003844± 6	
			N_2^{14} - $C^{12}O^{16}$			

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_7N^{14}$	Mass Spectra	14.007564± 7	$C^{12}H_2 - N^{14}$	H = 1.008165± 4	A. O. Nier Phys. Rev. 81, 624 (1951)
			$N^{14}_2\ C^{12}\ O^{16}$	C = 12.003850± 6	
			$C^{12}_3\ H_8 - N^{14}_2\ O^{16}$		
			$(N^{14})_2 - C^{12}O^{16}$	0.0112372±21	L. G. Smith and C. C. Damm Phys. Rev. 90, 324 (1953)
			$(C^{12})_2\ (H^1)_4 - (N^{14})_2$	0.0251493±41	
			$(C^{12})_2\ (H^1)_4 - C^{12}O^{16}$	0.0363877±41	
			$(C^{12})_2\ (H^1)_6 - N^{14}O^{16}$	0.0489623±55	
	Mass Spectra and Q-Values	14.007536±22	$Li^7 - 1/2\ N^{14}$	H = 1.0081283±28	K. T. Bainbridge NYO-849 June (1948)
			$CH_2 - N^{14}$	Li^7 = 7.01820±10	
				C = 12.003856±19	

	Method	Mass	Reaction or Doublet	Reference Masses		References
$_7N^{15}$	Fermi Formula	15.00167				
	Q-Value	15.004863±12	N^{14} (n, γ) N^{15}	H	= 1.008142± 3	C. W. Li, et al Phys. Rev. 83, 512 (1951)
			N^{14} (d, p) N^{15}	C^{12}	=12.003804±17	
			N^{15} (p, α) C^{12}	C^{13}	=13.007473±14	
			N^{15} (d, α) C^{13}	N^{14}	=14.007515±11	
			O^{15} (β^+) N^{15}	O^{15}	=15.007768±13	
	Mass Spectra	15.0049202±9	$C^{12}H_3{}^1$ - N^{15}	H C	= 1.008145± 2 =12.003844± 6	K. Ogata and H. Matsuda Phys. Rev. 89, 27 (1953)
		15.004928±20	$C^{12}H_3$ - N^{15}	H C	= 1.008141± 2 =12.003807±11	1946 value H. Ewald Z. Naturforsch 6a, 293 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_7N^{16}$					
	Fermi Formula	16.00734			
	Graphical	16.0102± 7	Mass defect difference of the $_7N^{16}$ - $_8O^{16}$ isobars	Mass defect of $_8O^{16}$ 0.13661±20 (A = 4, 8, 12, . . . 36,	Mass defect differences of isobars $X_{Z-1}{}^{A-}Y_Z = \Delta E_{4n}{}^A$ plotted as a function of A and Z = A/2) T. Z. Szelenyi Phys. Rev. 75 1105 (1949)
$_8O^{15}$					
	Fermi Formula	15.00467			
	Q-Value	15.007768±13	O^{15} (β^+) N^{15}	H = 1.008142± 3 C =12.003804±17 N^{15}=15.004863±12	C. W. Li, et al Phys. Rev. 83, 512 (1951)
$_8O^{16}$					
	Fermi Formula	15.99607			
	Standard Value	16.00000			

	Method	Mass	Reaction or Doublet	Reference Masses		References
$_8O^{17}$						
	Fermi Formula	16.99903				
	Q-Value	17.004533± 7	O^{16} (d, p) O^{17} F^{19} (d, α) O^{17}	H C F^{19}	= 1.008142± 3 =12.003804±17 =19.004456±15	C. W. Li, et al Phys. Rev. 83, 512 (1951)
	Mass Spectra	17.004507±15	D_2HO^{16} -D_2O^{17}	H D	= 1.008141± 2 = 2.014732± 4	H. Ewald Z. Naturforsch 6a, 293 (1951)
$_8O^{18}$						
	Fermi Formula	17.99549				
	Q-Value	18.004857±23	O^{18} (p, n) F^{18} O^{18} (p, α) N^{15} F^{18} (β^+) O^{18}	H C N^{15} F^{18}	= 1.008142± 3 =12.003804±17 =15.004863±12 =18.006651±22	C. W. Li Phys. Rev. 88, 1038 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_9F^{17}$					
	Fermi Formula	17.00237			
	Q-Value	17.007505± 5	O^{16} (d, n) F^{17} F^{17} (β^+) O^{17}	H = 1.008142± 3 C = 12.003804±17 O^{17} = 17.004533± 7	C. W. Li Phys. Rev. 88 1038 (1952)
$_9F^{18}$					
	Fermi Formula	18.00238			
	Q-Value	18.006651±22	O^{18} (p, n) F^{18} F^{18} (β^+) O^{18} Ne^{20} (d, α) F^{18}	H = 1.008142± 3 C = 12.003804±17 O^{18} = 18.004857±23 Ne^{20} = 19.998777±21	C. W. Li Phys. Rev. 88 1038 (1952)
$_9F^{19}$					
	Fermi Formula	18.99643			
	Q-Value	19.004456±15	F^{19} (p, α) O^{16} F^{19} (d, p) F^{20} F^{19} (d, α) O^{17}	H = 1.008142± 3 C = 12.003804±17 O^{17} = 17.004533± 7 F^{20} = 20.006350±17	C. W. Li, et al Phys. Rev. 83, 512 (1951)
	Mass Spectra	19.004414±17	D_2O^{16} - $F^{19}H$	H = 1.008141± 2 D = 2.014732± 4	H. Ewald Z. Naturforsch 6a, 293 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses		References
$_9F^{19}$	Mass Spectra	19.004444±22	$B^{10}F^{19} - C^{13}O^{16}$ $B^{11}F^{19} - Si^{30}$	B^{10} B^{11} C^{13} Si^{30}	=10.016110±10 =11.012811± 9 =13.007505±12 =29.983307±31	K. Ogata and H. Matsuda Phys. Rev. 89, 27 (1953)
$_9F^{20}$	Fermi Formula	20.00032				
	Q-Value	20.006350±17	$F^{19}(n, \gamma)F^{20}$ $F^{19}(d, p)F^{20}$ $F^{20}(\beta^-)Ne^{20}$	H C F^{19} Ne^{20}	= 1.008142± 3 =12.003804±17 =19.004456±15 =19.998777±21	C. W. Li Phys. Rev. 88, 1038 (1952)
$_{10}Ne^{19}$	Fermi Formula	19.00008				
	Q-Value	19.007952±15	$F^{19}(p, n)Ne^{19}$ $Ne^{19}(\beta^+)F^{19}$	H C F^{19}	= 1.008142± 3 =12.003804±17 =19.004456±15	C. W. Li Phys. Rev. 88, 1038 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses		References
$_{10}Ne^{20}$						
	Fermi Formula	19.99214				
	Q-Value	19.998777±21	F^{20} (β^-) Ne^{20}	H	= 1.008142± 3	C. W. Li Phys. Rev. 88, 1038 (1952)
			Ne^{20} (d, p) Ne^{21}	C	=12.003804±17	
			Ne^{20} (d, α) F^{18}	F^{18}	=18.006651±21	
			Na^{23} (p, α) Ne^{20}	F^{20}	=20.006350+17	
				Ne^{21}	=21.000504±22	
				Na^{23}	=22.997055±25	
	Mass Spectra	19.998771±12	D_2O^{16} - Ne^{20}	H	= 1.008141± 2	H. Ewald Z. Naturforsch 6a, 293 (1951)
			H_2O^{18} - Ne^{20}	D	= 2.014732± 4	
		19.998772±13	B^{10} - 1/2 Ne^{20}	D	= 2.014741± 3	K. Ogata and H. Matsuda Phys. Rev. 89, 27 (1953)
			D_2O^{16} - Ne^{20}	B^{10}	=10.016110±10	
		19.998835±43	D_2O^{16} - Ne^{20}	D	= 2.014778± 8	A. O. Nier Phys. Rev. 81, 624 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses		References
$_{10}Ne^{20}$						
	Mass Spectra and Q-Value	19.99872±13	Be^9 H - 1/2 Ne^{20}	H	= 1.0081283±28	K. T. Bainbridge NYO-849, June (1948)
			B^{10} - 1/2 Ne^{20}	D	= 2.0147186±55	
			Ne^{20} - 1/2 A^{40}	Be^9	= 9.01506 ± 20	
				B^{10}	=10.01616 ± 13	
			D_2O^{16} - Ne^{20}	A^{40}	= Value not given	
$_{10}Ne^{21}$						
	Fermi Formula	20.99386				
	Q-Value	21.000504±22	Ne^{20} (d, p) Ne^{21}	H	= 1.008142± 3	C. W. Li Phys. Rev. 88, 1038 (1952)
			Ne^{21} (d, p) Ne^{22}	C	=12.003804±17	
			Ne^{21} (d, α) F^{19}	F^{19}	=19.004456±15	
			Na^{21} (β^+) Ne^{21}	Ne^{20}	=19.998777±21	
			Na^{23} (d, α) Ne^{21}	Ne^{22}	=21.998358±25	
				Na^{21}	=21.004286±39	
				Na^{23}	=22.997055±25	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{10}Ne^{21}$	Fermi Formula	21.00056	Na^{23} (d, α) Ne^{21}	Na^{23}=22.99697	A. Zucker W. W. Watson Phys. Rev. 78, 14 (1950)
		21.00067	Ne^{20} (d, p) Ne^{21}	Ne^{20}=19.99890	A. Zucker and W. W. Watson Phys. Rev. 78, 14 (1950)
	Mass Spectra	21.000393±22	D_2HO^{16} - Ne^{21}	H = 1.008141± 2 D = 2.014732± 4	H. Ewald Z. Naturforsch 6a, 293 (1951)
$_{10}Ne^{22}$	Fermi Formula	21.99000			
	Q-Value	21.998358±25	Ne^{21} (d, p) Ne^{22} Ne^{22} (d, p) Ne^{23} Na^{22} (β^+) Ne^{22}	H = 1.008142± 3 C =12.003804±17 Ne^{21}=21.000504±22 Ne^{23}=23.001768±26 Na^{22}=22.001409±25	C. W. Li Phys. Rev. 88, 1038 (1952)
		21.99852	Ne^{22} (d, p) Ne^{23}	Ne^{23}=23.00203 ±17	A. Zucker and W. W. Watson Phys. Rev. 78, 14 (1950)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{10}Ne^{22}$	Mass Spectra	21.998329±19	D_3O^{16} - Ne^{22}	D = 2.014732± 4	H. Ewald Z. Naturforsch 6a, 293 (1951)
		21.998382±24	B^{11} - 1/2 Ne^{22}	B^{11} =11.012811± 9	K. Ogata and H. Matsuda Phys. Rev. 89, 27 (1953)
$_{10}Ne^{23}$	Fermi Formula	22.99476			
	Q-Value	23.00160±40	Ne^{23} (β^-) Na^{23}	Na^{23} =22.99697	A. Zucker and W. W. Watson Phys. Rev. 78, 14 (1950)
		23.001768±26	Ne^{22}(d,p) Ne^{23}	H = 1.008142± 3 C^{22}=12.003804±17 Ne^{22}=21.998358±25	C. W. Li Phys. Rev. 88, 1038 (1952)

	Method	Mass	Reaction or Doublet	Reference Mass	References
$_{11}Na^{21}$					
	Fermi Formula	20.99783			
	Q-Value	21.004286±39	$Na^{21}(\beta^+)Ne^{21}$	H = 1.008142± 3 C_{21}=12.003804±17 Ne^{21}=21.000504±22	C. W. Li Phys. Rev. 88, 1038 (1952)
$_{11}Na^{22}$					
	Fermi Formula	21.99720			
	Q-Value	21.001409±25	$Na^{22}(\beta^+)Ne^{22}$	H = 1.008142± 3 C_{22}=12.003804±17 Ne^{22}=21.998358±25	C. W. Li Phys. Rev. 88, 1038 (1952)
$_{11}Na^{23}$					
	Fermi Formula	22.99136			
	Q-Value	22.99697	$Na^{23}(p, \alpha)Ne^{20}$	Ne^{20}=19.99890±47	A. Zucker and W. W. Watson Phys. Rev. 78, 14 (1950)

	Method	Mass	Reaction or Doublet		Reference Masses		References
$_{11}Na^{23}$	Q-Value	22.997055±25	Na^{23} (p, n)	Mg^{23}	H	= 1.008142 ± 3	C. W. Li Phys. Rev. 88, 1038 (1952)
			Na^{23} (p, α)	Ne^{20}	C	= 12.003804 ±17	
			Na^{23} (d, p)	Na^{24}	Ne^{20}	= 19.998777 ±21	
			Na^{23} (d, α)	Ne^{21}	Ne^{21}	= 21.000504 ±22	
			Mg^{25} (d, α)	Na^{23}	Na^{24}	= 23.998568 ±26	
					Mg^{23}	= 23.001453 ±26	
					Mg^{25}	= 24.993745 ±27	
		*22.99705± 3	Na^{23} (p, n)	Mg^{23}	Mg^{23}	= 23.001453 ±26	A. B. Willard et al Phys. Rev. 84, 259 (1952)
					Δm	= 0.00440	
	Mass Spectra	22.99665± 8	ODH -	Ne^{20}	H	= 1.0081441 ± 2	A. Henglein Z. Naturforsch 6a, 745 (1951)
			Ne^{20} -	Ne^{21}	D	= 2.014732 ± 4	
			Ne^{21} -	Ne^{22}	Ne^{20}	= 19.998771 ±12	
			Na^{23} -	Ne^{22}	Ne^{21}	= 21.000393 ±22	
					Ne^{22}	= 21.998329 ±19	
$_{11}Na^{24}$	Fermi Formula	23.99401					
	Q-Value	23.998568±26	Na^{23} (d, p)	Na^{24}	H	= 1.008142 ± 3	C. W. Li Phys. Rev. 88, 1038 (1952)
			Na^{24} (β^-)	Mg^{24}	C	= 12.003804 ±17	
					Na^{23}	= 22.997055 ±25	
					Mg^{24}	= 23.992628 ±26	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{12}Mg^{23}$					
	Fermi Formula	22.99562			
	Q-Value	23.001453±26	Na^{23} (p, n) Mg^{23}	H = 1.008142± 3 C = 12.003804±17 Na^{23} = 22.997055±25	C. W. Li Phys. Rev. 88, 1038 (1952)
	*	23.00145± 3		Na^{23} = 22.997055±25 Δm = 0.00440	A. B. Willard et al Phys. Rev. 84, 259 (1952)
$_{12}Mg^{24}$					
	Fermi Formula	23.98810			
	Q-Value	23.992628±26	Na^{24} (β^-) Mg^{24} Mg^{24} (d, p) Mg^{25} Al^{27} (p, α) Mg^{24}	H = 1.008142 ±3 C = 12.003804±17 Na^{24} = 23.998568±26 Mg^{25} = 24.993745±27 Al^{27} = 26.990071±30	C. W. Li Phys. Rev. 88, 1038 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{12}Mg^{25}$					
	Fermi Formula	24.98893			
	Q-Value	24.993745±27	Mg^{24} (d, p) Mg^{25} Mg^{25} (d, p) Mg^{26} Mg^{25} (d, α) Na^{23} Al^{27} (d, α) Mg^{25}	H = 1.008142± 3 C = 12.003804±17 Na^{23} = 22.997055±25 Mg^{25} = 23.992628±26 Mg^{26} = 25.990802±29 Al^{27} = 26.990071±30	C. W. Li Phys. Rev. 88, 1038 (1952)
$_{12}Mg^{26}$					
	Fermi Formula	25.98483			
	Q-Value	25.990802±29	Mg^{25} (d, p) Mg^{26} Mg^{26} (d, p) Mg^{27}	H = 1.008142± 3 C = 12.003804±17 Mg^{25} = 24.993745±27 Mg^{27} = 26.992876±30	C. W. Li Phys. Rev. 88, 1038 (1952)
$_{12}Mg^{27}$					
	Fermi Formula	26.98832			
	Q-Value	26.992876±30	Mg^{26} (d, p) Mg^{27}	H = 1.008142± 3 C = 12.003804±17 Mg^{26} = 25.990802±29	C. W. Li Phys. Rev. 88, 1038 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{13}Al^{27}$	Fermi Formula	26.98659			
	Q-Value	26.990071±30	Al^{27} (n, γ) Al^{28} Al^{27} (p, α) Mg^{24} Al^{27} (d, p) Al^{28} Al^{27} (d, α) Mg^{25} Si^{29} (d, α) Al^{27}	H = 1.008142± 3 C = 12.003804±17 Mg^{24} = 23.992628±26 Mg^{25} = 24.993745±27 Al^{28} = 27.990760±32 Si^{29} = 28.985650±34	C. W. Li Phys. Rev. 88, 1038 (1952)
		26.990140±35	Al^{27} (n, γ) Al^{28} Al^{27} (d, p) Al^{28} Si^{29} (d, α) Al^{27}	Si^{28} = 27.985837±30 P^{31} = 30.983622±30 S^{32} = 31.982265±30	H. T. Motz Phys. Rev. 85, 501 (1952)
	Mass Spectra	26.990109±23	C_2H_3 - Al^{27}	C^{12} = 12.003844± 6 H = 1.008145± 2	K. Ogata and H. Matsuda Phys. Rev. 89, 27 (1953)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{13}Al^{28}$	Fermi Formula	27.98829			
	Q-Value	27.990760±32	Al^{27} (n, γ) Al^{28} Al^{27} (d, p) Al^{28} Al^{28} (β^-) Si^{28} Si^{30} (d, α) Al^{28}	H = 1.008142± 3 C = 12.003804±17 Al^{27} = 26.990071±30 Si^{28} = 27.985767±32 Si^{30} = 29.983237±36	C. W. Li Phys. Rev. 88, 1038 (1952)
$_{14}Si^{27}$	Fermi Formula	26.99142			
	Q-Value*	26.99530± 2	Al^{27} (p, n) Si^{27}	Δm = 0.00519 Al^{27} = 26.990109±23	J. D. Kingston et al Phys. Rev. 89, 530 (1953)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{14}Si^{28}$	Fermi Formula	27.98418			
	Q-Value	27.985767±32	Al^{28} (β^-) Si^{28} Si^{28} (n, γ)Si^{29} Si^{28} (d, p)Si^{29} P^{31} (p, α)Si^{28}	H = 1.008142± 3 C = 12.003804±17 Al^{28} = 27.990760±32 Si^{29} = 28.985650±34 P^{31} = 30.983550±39	C. W. Li Phys. Rev. 88, 1038 (1952)
	Mass Spectra	27.985792±32	C^{12} O^{16} -Si^{28}	C^{12} = 12.003807±11	H. Ewald Z. Naturforsch 6a, 293 (1951)
		27.98581 ±8	Fe^{56}-Si^{28}-$C^{12}O^{16}$-$C^{12}_2H_4$	H= 1.0081283±28 C^{12}= 12.003856 ±19 Fe^{56}= 55.95285 ±16	H. E. Duckworth and R. S. Preston Phys. Rev. 79, 402 (1950) NYO-677, 4-25-50 NYO-678, 11-20-50
		27.985825±16	$C^{12}O^{16}$ - Si^{28}	C^{12} = 12.003844 ±6	K. Ogata and H. Matsuda Phys. Rev. 89, 27 (1953)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{14}Si^{29}$					
	Fermi Formula	28.98433			
	Q-Value	28.985650±34	Si^{28} (n, γ) Si^{29} Si^{28} (d, p) Si^{29} Si^{29} (d, p) Si^{30} Si^{29} (d, α) Al^{27} P^{31} (d, α) Si^{29}	H = 1.008142± 3 C = 12.003804±17 Al^{27} = 26.990071±30 Si^{28} = 27.985767±32 P^{31} = 30.983550±39	C. W. Li Phys. Rev. 88, 1038 (1952)
		28.985719±30	Si^{29} (d, α) Al^{27} Si^{28} (d, p) Si^{29} P^{31} (d, α) Si^{29} Si^{29} (d, p) Si^{30}	Si^{28} = 27.985837±30 P^{31} = 30.983622±30 S^{32} = 31.982265±30	H. T. Motz Phys. Rev. 85, 501 (1952)
		28.98568	Si^{30} (d, n) P^{31} (γ, n) P^{30} Al^{27} (α, p) Si^{30} Al^{27} (α, n) P^{30} Si^{29} (d, n) P^{30}	Si^{30} = 29.98290± 15	A. S. Penfold Phys. Rev. 80, 116 (1950)
	Mass Spectra	28.98567±14	Si^{29} - Ni^{58} Si^{28} (d, p) Si^{29}	Si^{28} = 27.98581± 8 Ni^{58} = 57.95354± 23	H. E. Duckworth and R. S. Preston Phys. Rev. 79, 402 (1950)

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	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{14}Si^{29}$	Mass Spectra	28.985705±21	C^{13} O^{16} - Si^{29}	C^{13} = 13.007505±12	K. Ogata and H. Matsuda Phys. Rev. 89, 27 (1953)
$_{14}Si^{30}$	Fermi Formula	29.98003			
	Q-Value	29.983237±36	Si^{29} (d, p) Si^{30} Si^{30} (d, p) Si^{31} Si^{30} (d, α) Al^{28}	H = 1.008142± 3 C = 12.003804±17 Al^{28} = 27.990760±32 Si^{29} = 28.985650±34 Si^{31} = 30.985140±39	C. W. Li Phys. Rev. 88, 1038 (1952)
		29.98327 ± 5	Si^{29} (d, p) Si^{30}	Si^{29} = 28.98567 ±14	H. E. Duckworth NYO-981 4-18-52
		29.983313±35	Si^{29} (d, p) Si^{30} Si^{30} (d, p) Si^{31} Si^{30} (d, α) Al^{28}	Si^{29} = 28.985719±30 Si^{31} = 30.985210±30 Al^{28} = 27.990830±35	H. T. Motz Phys. Rev. 85, 501 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{14}Si^{30}$	Mass Spectra	29.98290±15	CH_3 - Si^{30}	H = 1.0081283±28 C = 12.003856 ±19	H. E. Duckworth et al Phys. Rev. 78, 479 (1950) Phys. Rev. 79, 188 (1950) NYO-676 , 4-25-50 NYO-678 , 11-20-50
		29.983307±31	$B^{11}F^{19}$ - Si^{30}	B^{11} = 11.012811 ± 9 F^{19} = 19.004444 ±22	K. Ogata and H. Matsuda Phys. Rev. 89, 27 (1953)
$_{14}Si^{31}$	Fermi Formula	30.98255			
	Q-Value	30.985210±30	$Si^{30}(d,p)$ Si^{31}	Si^{28} = 27.985837 ±30 P^{31} = 30.983622 ±30 S^{32} = 31.982265 ±30	H. T. Motz Phys. Rev. 85, 501 (1952)
		30.985140±39	$Si^{30}(d,p)$ Si^{31} $Si^{31}(\beta^-)$ P^{31}	H = 1.008142 ± 3 C = 12.003804 ±17 Si^{30} = 29.983237 ±36 P^{31} = 30.983550 ±39	C. W. Li Phys. Rev. 88, 1038 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{15}P^{31}$					
	Fermi Formula	30.98217			
	Q-Value	30.983550±39	$Si^{31}(\beta^-)\ P^{31}$	H = 1.008142 ± 3	C. W. Li Phys. Rev. 88, 1038 (1952)
			$P^{31}(n, \gamma)\ P^{32}$	C = 12.003804 ±17	
			$P^{31}(d, p)\ P^{32}$	Si^{28} = 27.985767 ±32	
			$P^{31}(p, \alpha)\ Si^{28}$	Si^{29} = 28.985650 ±34	
			$P^{31}(d, \alpha)\ Si^{29}$	Si^{31} = 30.985140 ±39	
				P^{32} = 31.984016 ±41	
	Mass Spectra	30.983619± 7	$O^{16}_2 - P^{31}H$	H = 1.008145 ± 2	K. Ogata and H. Matsuda Phys. Rev. 89, 333 (1953)
			$S^{32} - P^{31}H$	S^{32} = 31.982274 ± 8	
		30.983622±23	$O^{16}_2 - P^{31}H$	H = 1.008141 ± 2	H. Ewald Z. Naturforsch 6a, 293 (1951)
			$S^{32} - P^{31}H$	S^{32} = 31.982272 ±19	
			$P^{31}H_3 - S^{32}H_2$		
			$P^{31}H_3 - S^{34}$	S^{34} = 33.978770 ±31	H. Ewald Z. Naturforsch 6a, 293 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{15}P^{32}$					
	Fermi Formula	31.98314			
	Q-Value	31.984016±41	P^{31} (n, γ) P^{32} P^{31} (d, p) P^{32} P^{32} (β^-) S^{32}	H = 1.008142 ± 3 C = 12.003804 ±17 P^{31} = 30.983550 ±39 S^{32} = 31.982183 ±42	C. W. Li Phys. Rev. 88, 1038 (1952)
		31.984091±30	P^{31} (d, p) P^{32} P^{32} (β^-) S^{32}	P^{31} = 30.983622 ±30 S^{32} = 31.982265 ±30	H. T. Motz Phys. Rev. 85, 501 (1952)
$_{15}P^{33}$					
	Fermi Formula	32.97989			
	Q-Value	32.982166±44	P^{33} (β^-) S^{33}	H = 1.008142 ± 3 C = 12.003804 ±17 S^{33} = 32.981881 ±44	C. W. Li Phys. Rev. 88, 1038 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{16}S^{32}$	Fermi Formula	31.98051			
	Q-Value	31.982183±42	$P^{32}(\beta^-)\ S^{32}$ $S^{32}(n, \gamma)\ S^{33}$ $S^{32}(d, p)\ S^{33}$	H = 1.008142 ± 3 C = 12.003804 ±17 P^{32} = 31.984016 ±41 S^{33} = 32.981881 ±44	C. W. Li Phys. Rev. 88, 1038 (1952)
		31.98199	$Si^{30}(d, n)\ P^{31}(\gamma, n)\ P^{30}$ $Si^{30} \rightarrow P^{30}$ $Si^{30}(p, \alpha)\ Al^{27}(\alpha, n)\ P^{30}$ } P^{30} weighted mean	Si^{30} = 29.98290 ±15	A. S. Penfold Phys. Rev. 80, 116 (1950)
			$P^{30}_{wm} \rightarrow Si^{29}(\alpha, n)\ S^{32}$ $P^{30}_{wm}(d, \gamma)\ S^{32}$ $Si^{30} \rightarrow P^{31} \rightarrow S^{31}(n, \gamma)\ S^{32}$ } S^{32} weighted mean		

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{16}S^{32}$	Q-Value		S^{32} (γ, d) P^{30} S^{32} (γ, n) S^{31} S^{32} (n, α) Si^{29} P^{31} (γ, n) P^{30} Si^{29} (d, n) P^{30} Al^{27} (α, n) P^{30} Al^{27} (α, p) Si^{30}		A. S. Penfold Phys. Rev. 80, 116 (1950)
		31.98228± 5	P^{32} (β^-) S^{32} P^{31} (d, p) P^{32} P^{31} (d, α) Si^{29}	Si^{29} = 28.98571± 5	H. T. Motz Phys. Rev. 81, 1061 (1951)
	Mass Spectra	31.982236±7	O_2 - S^{32} C_4 - $S^{32}O$ CO_2 - C^{12} S^{32}	C^{12} = 12.003842± 4	T. L. Collins, et al Phys. Rev. 84, 717 (1951)
		31.98237± 9	O_2 - S^{32}	O = 16.00000	H. E. Duckworth, et al Phys. Rev. 81, 286 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{16}S^{32}$	Mass Spectra	31.982272±19	$O_2 - S^{32}$ $P^{31}H - S^{32}$ $P^{31}H_3 - S^{32}H_2$	H = 1.008141± 2 P^{31} = 30.983622± 23	H. Ewald Z. Naturforsch 6a, 293 (1951)
		31.982274± 8	$O_2 - S^{32}$ $C_4 - S^{32}O$	C = 12.003844± 6	K. Ogata and H. Matsuda Phys. Rev. 89, 27 (1953)
		31.9823 ±30	$O_2 - S^{32}$	O = 16.00000	F. W. Aston Proc. Roy. Soc. (London) A163, 391 (1937)
		31.9823 ±10	$O_2 - S^{32}$	O = 16.00000	L. G. Smith Phys. Rev. 81, 295 (1951)
	Time-of-Flight	31.983 ± 1	Time-of-flight of CS^+ with C_6H_{12}, C_3H_6O standards	H = 1.0081386 C = 12.003895	E. E. Hays, et al Phys. Rev. 84, 824 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{16}S^{33}$	Fermi Formula	32.98011			
	Q-Value	32.98052±20	S^{32} (d, p) S^{33}	S^{32} = 31.98089± 7	P. W. Davison Phys. Rev. 75, 757 (1949)
		32.981881±44	S^{32} (n, γ) S^{33} S^{32} (d, p) S^{33}	H = 1.008142±3 C = 12.003804±17 S^{32} = 31.982183±42	C. W. Li Phys. Rev. 88, 1038 (1952)
	Mass Spectra	32.98213± 5	C_4H - $S^{33}O^{16}$	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins, et al Phys. Rev. 84, 717 (1951)
		32.981941±37	$S^{33}H_2$ - $S^{34}H$	H = 1.008145± 2 S^{34} = 33.978709±19	K. Ogata and H. Matsuda Phys. Rev. 89, 27 (1953)
	Microwave Spectra	32.98187± 25	O^{16} C^{12} S	S^{32} = 31.98199 S^{34} = 33.97890	S. Geschwind and R. Gunther-Mohr Phys. Rev. 81, 882 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{16}S^{34}$	Fermi Formula	33.97566			
	Q-Value	33.97780±44	S^{33} (d, p) S^{34}	S^{33} = 32.98052±20	P. W. Davison Phys. Rev. 75, 757 (1949)
	Mass Spectra	33.97876± 5	C_4H_2 - $S^{34}O$	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins, et al Phys. Rev. 84, 717 (1951)
		33.978709±19	$S^{32}H_2$ - S^{34} C_3 - $S^{34}H_2$	H = 1.008145± 2 C^{12} = 12.003844± 6 S^{32} = 31.982274± 8	K. Ogata and H. Matsuda Phys. Rev. 89, 27 (1953)
		33.978770±31	$P^{31}H_3$ - S^{34} H_2S^{34} - HCl^{35}	H = 1.008141± 2 P^{31} = 30.983622±23 No value given for Cl^{35}	H. Ewald Z. Naturforsch 6a, 293 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{16}S^{35}$					
	Fermi Formula	34.97739			
	Microwave Spectra	34.98006±38	OCS	S^{32} = 31.98199±21 S^{33} = 32.98168 S^{34} = 33.97890	T. Wentink, Jr., et al AECU-1186 11-7-50 Phys. Rev. 81, 948 (1951)
		34.98046±35	OCS	S^{32} = 31.98199 S^{34} = 33.97890	S. Geschwind and R. Gunther-Mohr Phys. Rev. 81, 882 (1951) Using results from Wentink et al (see above) along with their own data.
$_{16}S^{36}$					
	Fermi Formula	35.97510			
	Microwave Spectra	35.97834±40	OCS	$S^{32} - S^{34}$ = 1.9969±2 No other mass or reference given	W. Low and C. H. Townes Phys. Rev. 75, 529 (1949)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{16}S^{36}$	Microwave Spectra	35.97954±60	OCS	S^{32} = 31.98199 S^{34} = 33.97890	S. Geschwind and R. Gunther-Mohr Phys. Rev. 81, 882 (1951) Using results from Low and Townes (see above) along with own data.
$_{17}Cl^{35}$	Fermi Formula	34.97816			
	Mass Spectra	34.98004± 5	C_3 - H Cl^{35}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 84, 717 (1951)
		34.980064±22	C_3 - H Cl^{35}	H = 1.008145± 2 C = 12.003844± 6	K. Ogata and H. Matsuda Phys. Rev. 89, 27 (1953)
	Time-of-Flight	34.9805 ± 5	C Cl_3^+ - C_6 H_{12} - C_8H_{10}	H = 1.0081386 C = 12.003895	E. E. Hayes, et al Phys. Rev. 84, 824 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{17}Cl^{37}$					
	Fermi Formula	36.97503			
	Mass Spectra	36.97766± 5	C_3H_2 - HCl^{37}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins, et al Phys. Rev. 84, 717 (1951)
$_{17}Cl^{39}$					
	Fermi Formula	38.97567			
	Q-Value	38.97871±10	A^{40} (γ, p) Cl^{39}	A^{40} = 39.97524 ± 3	D. H. Wilkinson and J. H. Carver, Phys. Rev. 83, 466 (1951). They say Haslam et al neglect potential barrier effect.
		38.98022±13	Cl^{39} (β^-) A^{39}	A^{39} = 38.97667± 4	C. E. Anderson, et al Phys. Rev. 87, 897 (1952) They say their new data contradicts that of Wilkinson and Carver and Haslam et al.
		38.9826	A^{40} (γ, p) Cl^{39}	A^{40} = 39.97549±12 (Rosenfeld)	R. N. H. Haslam et al Phys. Rev. 80, 318 (1950)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{18}A^{36}$	Fermi Formula	35.97717			
	Mass Spectra	35.97900± 3	C_3 - A^{36} H_2O -1/2 A^{36}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 84, 717 (1951)
		35.97926± 8	H_2O -1/2 A^{36}	H = 1.008165± 4	A. O. Nier Phys. Rev. 81, 624 (1951)
$_{18}A^{38}$	Fermi Formula	37.97173			
	Mass Spectra	37.97491± 4	C_3H_2 - A^{38}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 84, 717 (1951)
$_{18}A^{39}$	Fermi Formula	38.97282			
	Q-Value	38.97667± 4	A^{39} (β^-) K^{39}	K^{39} = 38.97606± 3	C. E. Anderson et al Phys. Rev. 87, 897 (1952)
		38.9790	Cl^{39} (β^-) A^{39}	Cl^{39} = 38.9826	R. N. H. Haslam et al Phys. Rev. 80, 318 (1950)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{18}A^{40}$					
	Fermi Formula	39.97020			
	Mass Spectra	39.97513± 3	C_3H_4 - A^{40}	H = 1.008146± 3	T. L. Collins et al Phys. Rev. 84, 717 (1951)
			D_2O - 1/2 A^{40}	C = 12.003842± 4	
			Ne^{20} - 1/2 A^{40}	D = 2.014740± 6	
			D_2O - Ne^{20}		
		39.975022±29	D_2O - A^{40++}	D = 2.014732± 4	H. E. Ewald Z. Naturforsch 6a, 293 (1951)
		39.975148±24	D_2O - 1/2 A^{40}	H = 1.008145 ± 2	K. Ogata and H. Matsuda Phys. Rev. 89, 27 (1953)
			C_3H_4 - A^{40}	D = 2.014741± 3	
				C = 12.003844± 6	
		39.974940±15	C_2O - A^{40}	C = 12.003842± 4	Walter H. Johnson, Jr. Phys. Rev. 88, 1213 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{18}A^{41}$	Fermi Formula	40.97293			
	Q-Value	*40.97764± 5	A^{40} (d, p) A^{41}	Δm = 1.00249± 5 n = 1.00897 H = 1.008128 D = 2.014718 A = 39.975148±24	V. L. Sailor Phys. Rev. 75, 1836 (1949)
$_{19}K^{39}$	Fermi Formula	38.97460			
	Q-Value	38.97613±30	K^{40} (d, p) K^{39} K^{39} (α, p) Ca^{42}	S^{32} = 31.98089 A^{40} = 39.97516±26 H^1 = 1.008128 D^2 = 2.014718 α = 4.003880	W. Low and C. H. Townes Phys. Rev. 80, 608 (1950)
	Mass Spectra	37.97606± 6	C_3H_3 - K^{39}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 84, 717 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{19}K^{40}$					
	Fermi Formula	39.97447			
	Q-Value	*39.97682±10	A^{40} (p, n) K^{40} K^{40} (EC) A^{40}	n = 1.00897 H = 1.008128 D = 2.014718 A^{40} = 39.975148 + - 24 Δm = 0.0017 (p, n) Δm = 0.00167±10 (EC)	V. L. Sailor Phys. Rev. 75, 1836 (1949)
	Mass Spectra	39.97654± 8	C_2O - K^{40}	C = 12.003842± 4	W. H. Johnson, Jr. Phys. Rev. 88, 1213 (1952)
$_{19}K^{41}$					
	Fermi Formula	40.97075			
	Q-Value	*40.97490±20	A^{41} (β^-) K^{41}	Δm = 0.00274±20 n = 1.00897 H = 1.008128 D = 2.014718 A^{40} = 39.975148±24 A^{41} = 40.97764 ± 5	V. L. Sailor Phys. Rev. 75, 1836 (1949)
		*40.97487±10	K^{41} (p, n) Ca^{41}	Ca^{41} = 40.97534 ±10 Δm = 0.00047 ± 7	
	Mass Spectra	40.97490± 4	C_3H_5 - K^{41}	H = 1.008146 ± 3 C = 12.003842±4	T. L. Collins et al Phys. Rev. 84, 717 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{19}K^{41}$	Time-of-Flight	40.975± 2	K^+ ion using K^{39} standard	K^{39} = not given	E. E. Hayes et al Phys. Rev. 84, 824 (1951)
$_{20}Ca^{40}$	Fermi Formula	39.97421			
	Q-Value	*39.97537±10	K^{40} (β^-) Ca^{40}	Δm = 0.00145 ± 5 n = 1.00897 H = 1.008128 D = 2.0014718 A^{40} = 39.975148 ±24 K^{40} = 39.97682 ±10	V. L. Sailor Phys. Rev. 75, 1836 (1949)
	Mass Spectra	39.975127±11	C_2O - Ca^{40}	C = 12.003842 ± 4	W. H. Johnson, Jr. Phys. Rev. 88, 1213 (1952)
		39.97545 ± 9	A^{40} - Ca^{40}	A^{40} = 39.97513 ± 3	T. L. Collins et al Phys. Rev. 84, 717 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{20}Ca^{41}$	Fermi Formula	40.97299			
	Q-Value	*40.97534±10	Ca^{40} (d, p) Ca^{41}	Δm = 0.99997 ± 5 n = 1.00897 H = 1.008128 D = 2.0014718 A^{40} = 39.975148±24 Ca^{40} = 39.97537 ±10	V. L. Sailor Phys. Rev. 75, 1836 (1949)
$_{20}Ca^{42}$	Fermi Formula	41.96828			
	Mass Spectra	41.97216± 4	C_3H_6 - Ca^{42}	H = 12.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 84, 717 (1951)
$_{20}Ca^{43}$	Fermi Formula	42.96883			
	Mass Spectra	42.97251± 6	C_3H_7 - Ca^{43}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 84, 717 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{20}Ca^{44}$					
	Fermi Formula	43.96592			
	Mass Spectra	43.96924± 6	CO_2 - Ca^{44}	C = 12.003842 ± 4	T. L. Collins et al Phys. Rev. 84, 717 (1951)
$_{20}Ca^{48}$					
	Fermi Formula	47.97013			
	Mass Spectra	47.96778±10	C_4 - Ca^{48}	C = 12.003842± 4	T. L. Collins et al Phys. Rev. 84, 717 (1951)
$_{21}Sc^{45}$					
	Fermi Formula	44.96704			
	Q-Value	44.97046±53	$Ti^{46}(\gamma, n)\ Ti^{45}$ $Sc^{45}(\beta^+)\ Ti^{45}$	Ti^{46} = 45.96733 ±48	H. E. Duckworth NYO-981 4-18-52
	Mass Spectra	44.97010± 5	$C_2O_2H_5$ - $Sc^{45}O$	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 84, 717 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{22}Ti^{46}$					
	Fermi Formula	45.96531			
	Q-Value	45.96733±48	Ti^{47} (d, p) Ti^{46}	Ti^{47} = 46.96694 ±47	H. E. Duckworth NYO-981 4-18-52
	Mass Spectra	45.96612±95	$C^{12}S^{32}H_2$ -Ti^{46}	H = 1.008131± 3.3 C = 12.003871±33 S = 31.98089 ± 7	T. Okuda and K. Ogata Phys. Rev. 60, 690 (1941)
		45.96697± 5	$C^{12}S^{32}H_2$- Ti^{46}	H = 1.008146± 3 C = 12.003842± 4 S = 31.982236± 7	T. L. Collins et al Phys. Rev. 86, 408 (1952)
$_{22}Ti^{47}$					
	Fermi Formula	46.96540			
	Q-Value	46.96694±47	Ti^{48} (d, p) Ti^{47}	Ti^{48} = 47.96405 ±19	H. E. Duckworth and R. S. Preston NYO-678 11-20-50; H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{22}Ti^{47}$	Mass Spectra	46.96668±10	CH_3S - Ti^{47}	H = 1.008146± 3 C = 12.003842± 4 S = 31.982236± 7	T. L. Collins et al Phys. Rev. 86, 408 (1952)
$_{22}Ti^{48}$	Fermi Formula	47.96225			
	Mass Spectra	47.96317± 6	C_4 - Ti^{48}	C = 12.003842± 4	T. L. Collins et al Phys. Rev. 86, 408 (1952)
		47.96332±48	C_4 - Ti^{48}	C = 12.003871±33	T. Okuda and K. Ogata Phys. Rev. 60, 690 (1941)
		47.96405±19	O^{16} - Ti^{48}	O = 16.00000	H. E. Duckworth and R. S. Preston Phys. Rev. 82, 468 (1951); NYO-678 11-20-50 H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{22}Ti^{49}$	Fermi Formula	48.96377			
	Q-Value	48.96428±20	Ti^{48} (d, p) Ti^{49}	Ti^{48} = 47.96405±19	H. E. Duckworth and R. S. Preston NYO-678 11-20-50; H. E. Duckworth NYO-981 4-18-52
	Mass Spectra	48.96479± 53	C_4H - Ti^{49}	H = 1.008131± 3.3 C = 12.003871±33	T. Okuda and K. Ogata Phys. Rev. 60, 690 (1941)
		48.96358± 5	C_4H - Ti^{49}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 86, 408 (1952)
$_{22}Ti^{50}$	Fermi Formula	49.96208			
	Mass Spectra	49.96229±38	C_4H_2 - Ti^{50}	H = 1.008131± 3.3 C = 12.003871±33	T. Okuda and K. Ogata Phys. Rev. 60, 690 (1941)
		49.96077± 4	C_4H_2 - Ti^{50}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 86, 408 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{23}V^{48}$	Fermi Formula	47.96796			
	Q-Value	47.96840	V^{48} (β^+) Ti^{48}	Ti^{48} = 47.96405±19	H.E. Duckworth NYO-981 4-18-52
$_{23}V^{50}$	Fermi Formula	49.96446			
	Q-Value	49.96255±29	V^{51} (γ, n) V^{50}	V^{51} = 50.95955±22	H. E. Duckworth NYO-981 4-18-52
	Mass Spectra	49.96330±12	C_4H_2 - V^{50}	H = 1.008146± 3 C = 12.003842± 4	W. H. Johnson, Jr. Phys. Rev. 87, 166 (1952)
$_{23}V^{51}$	Fermi Formula	50.96190			
	Q-Value	50.95955±22	C^{52} (γ, n) Cr^{51} V^{51} (p, n) Cr^{51} V^{52} (γ, n) V^{51} V^{52} (β^-) Cr^{52}	Cr^{52} = 51.95696 ±21	H. E. Duckworth NYO-981 4-18-52
	Mass Spectra	50.96052± 5	C_4H_3 - V^{51}	H = 21.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 86, 408 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{24}Cr^{49}$					
	Fermi Formula	48.96775			
	Q-Value	48.96546±28	Cr^{50} (γ, n) Cr^{49}	Cr^{50} = 49.96005 ±20	H. E. Duckworth NYO-981 4-18-52
$_{24}Cr^{50}$					
	Fermi Formula	49.96284			
	Mass Spectra	49.96005±20	C_2H - Cr^{50}	H = 1.008142± 3 C = 12.003804±17	H. E. Duckworth NYO-981 4-18-52
		49.96443±39	C_4H_2 - Cr^{50}	H = 1.008131± 3.3 C = 12.003871±33	K. Ogata Phys. Rev. 75, 200 (1949)
		49.96210± 7	C_4H_2 - Cr^{50}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 86, 408 (1952)
$_{24}Cr^{51}$					
	Fermi Formula	50.96253			
	Q-Value	50.96038±23	Cr^{52} (γ, n) Cr^{51} V^{51} (p, n) Cr^{51}	Cr^{52} = 51.95696 ±21	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{24}Cr^{52}$					
	Fermi Formula	51.95916			
	Mass Spectra	51.95696±21	C_2H_2 - Cr^{52}	H = 1.008142± 3 C = 12.003804±17	H. E. Duckworth NYO-981 4-18-52
		51.95598±44	C_4H_4 - Cr^{52}	H = 1.008131± 3.3 C = 12.003871±33	K. Ogata Phys. Rev. 75, 200 (1949)
		51.95707± 9	C_4H_4 - Cr^{52}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 86, 408 (1952)
$_{24}Cr^{53}$					
	Fermi Formula	52.96019			
	Q-Value	52.95770±20	Cr^{53} (γ, n) Cr^{52} Cr^{53} (p, n) Mn^{53} Fe^{53} (β^+) Mn^{53} Fe^{54} (γ, n) Fe^{53}	Cr^{52} = 51.95696 ±21 Fe^{54} = 53.95693 ±23	H. E. Duckworth NYO-981 4-18-52
	Mass Spectra	52.95818±63	Cr^{53} - Pd^{106}	Pd^{106} = 105.9375 ±12	H. E. Duckworth and R.S. Preston NYO-678 11-20-50

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{24}Cr^{53}$	Mass Spectra	52.95527±44	C_4H_5 - Cr^{53}	H = 1.008131± 3.3 C = 12.003871±33	K. Ogata Phys. Rev. 75, 200 (1949)
		52.95772± 8	C_4H_5 - Cr^{53}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 86, 408 (1952)
$_{24}Cr^{54}$	Fermi Formula	53.95820			
	Q-Value	53.95573±26	Cr^{54} (p, n) Mn^{54} Mn^{55} (γ, n) Mn^{54}	Mn^{55} = 54.95536 ±15	H. E. Duckworth NYO-981 4-18-52
	Mass Spectra	53.95427±48	C_4H_6 - Cr^{54}	H = 1.008131± 3.3 C = 12.003871±33	K. Ogata Phys. Rev. 75, 200 (1949)
		53.9563 ± 2	C_4H_6 - Cr^{54}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 86, 408 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{25}Mn^{53}$					
	Fermi Formula	52.96130			
	Q-Value	52.95844± 2	No method given		H. E. Duckworth NYO-981 4-18-52
$_{25}Mn^{54}$					
	Fermi Formula	53.96145			
	Q-Value	53.95721±25	Mn^{54} (EC) Cr^{54}	Cr^{54} = 53.95573 ±26	H. E. Duckworth NYO-981 4-18-53
$_{25}Mn^{55}$					
	Fermi Formula	54.95865			
	Q-Value	54.95522±23	Fe^{54} (d, p) Fe^{55} Fe^{55} (γ, n) Fe^{54} Fe^{55} (EC) Mn^{55}	Fe^{54} = 53.95653 ±22	H. E. Duckworth NYO-981 4-18-52
		54.95545±18	Mn^{55} (p, n) Fe^{55} Mn^{56} (γ, n) Mn^{55} Mn^{55} (d, p) Mn^{56} Mn^{56} (β^-) Fe^{56}	Fe^{56} = 55.95274 ±17	
	Ave.	54.95536±15			
	Mass Spectra	54.95581±10	C_4H_7 - Mn^{55}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 86, 408 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{25}Mn^{56}$					
	Fermi Formula	55.96003			
	Q-Value	55.95655±16	Mn^{56} (β^-) Fe^{56}	Fe^{56} = 55.95274 ±17	H. E. Duckworth NYO-981 4-18-52
$_{26}Fe^{53}$					
	Fermi Formula	52.96587			
	Q-Value	52.96230±22	Fe^{53} (β^+) Mn^{53}	Mn^{53} = 52.95844 ±20	H. E. Duckworth NYO-981 4-18-52
$_{26}Fe^{54}$					
	Fermi Formula	53.96088			
	Mass Spectra	53.95653±22	C_2H_3 -1/2 Fe^{54}	H = 1.008142± 3 C = 12.003804±17	H. E. Duckworth NYO-981 4-18-52
		53.95774±48	C_4H_6 - Fe^{54}	H = 1.008131± 3.3 C = 12.003871±33	K. Ogata Phys. Rev. 75, 200 (1949)
		53.95704± 5	C_4H_6 - Fe^{54}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 86, 408 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{26}Fe^{55}$					
	Fermi Formula	54.96021			
	Q-Value	54.95559±16	Fe^{55} (EC) Mn^{55}	Mn^{55} = 54.95536 ±15	H. E. Duckworth NYO-981 4-18-52
$_{26}Fe^{56}$					
	Fermi Formula	55.95665			
	Mass Spectra	55.95274±17	CO - 1/2 Fe^{56}	H = 1.008142± 3	H. E. Duckworth NYO-981 4-18-52
			C_2H_4 - 1/2 Fe^{56}	C = 12.003804±17	
			Si^{28} - Fe^{56}	Si^{28} = 27.98579 ± 4	
		55.95340±27	C_4H_8 - Fe^{56}	H = 1.008131± 3.3 C = 12.003871±33	K. Ogata Phys. Rev. 75, 200 (1949)
		55.95272±10	C_4H_8 - Fe^{56}	H = 1.008146± 3	T. L. Collins et al Phys. Rev. 86, 408 (1952)
	Weighted Mean Duckworth and Collins et al	55.95274± 9			B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)

	Method	Mass	Reaction and Doublet	Reference Masses	References
$_{26}Fe^{57}$					
	Fermi Formula	56.95725			
	Q-Value	56.95352±17	Fe^{56} (n, γ) Fe^{57}	Fe^{56} = 55.95274±17	H. E. Duckworth NYO-981 4-18-52
	Mass Spectra	56.95485±52	C_4H_9 - Fe^{57}	H = 1.008131± 3.3 C = 12.003871±33	K. Ogata Phys. Rev. 75, 200 (1949)
		56.95359±10	C_4H_9 - Fe^{57}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 86, 408 (1952)
$_{26}Fe^{58}$					
	Fermi Formula	57.95499			
	Q-Value	57.95116±25	Co^{59} (γ, n) Co^{58} Co^{58} (β^+, EC)Fe^{58}	Co^{59} = 58.95160± 12	H. E. Duckworth NYO-981 4-18-53
	Mass Spectra	57.95091±49	C_4H_{10} - Fe^{58}	H = 1.008131± 3.3 C = 12.003871±33	K. Ogata Phys. Rev. 75 200 (1949)
		57.9520 ± 4	C_4H_{10}- Fe^{58}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys, Rev. 86, 408 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{26}Fe^{59}$					
	Fermi Formula	58.95673			
	Q-Value	58.95328±14	Fe^{59} (β^-) Co^{59}	Co^{59} = 58.95160±12	H. E. Duckworth NYO-981 4-18-52
$_{27}Co^{55}$					
	Fermi Formula	54.96512			
	Q-Value	54.95929±24	Co^{55} (β^+K) Fe^{55}	Fe^{55} = 54.95559±16	H. E. Duckworth NYO-981 4-18-52
$_{27}Co^{56}$					
	Fermi Formula	55.96360			
	Q-Value	55.95769±19	Co^{56} (β^+) Fe^{56}	Fe^{56} = 55.95274±17	H. E. Duckworth NYO-981 4-18-52
$_{27}Co^{57}$					
	Fermi Formula	56.95925			
	Q-Value	56.95503±19	Co^{57} (β^+) Fe^{57}	Fe^{57} = 56.95352±17	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet		Reference Masses	References
$_{27}Co^{58}$						
	Fermi Formula	57.95904				
	Q-Value	57.95363±24	Co^{58} (β^+)	Fe^{58}	Fe^{58} = 57.95116±25	H. E. Duckworth NYO-981 4-18-52
$_{27}Co^{59}$						
	Fermi Formula	58.95601				
	Q-Value	58.95157±10	Co^{59} (d, p)	Co^{60}	Ni^{60} = 59.94925±13	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
			Co^{60} (β^-)	Ni^{60}		
			Co^{59} (p, n)	Ni^{59}	Ni^{58} = 57.95349± 9	
			Ni^{58} (d, p)	Ni^{59}		
		*58.95157	Co^{59} (p, n)	Ni^{59}	Ni^{59} = 58.95273±13 Δm = 0.001155±3	J. J. G. McCue and W. M. Preston Phys. Rev. 84, 384 (1951)
$_{27}Co^{60}$						
	Fermi Formula	59.95697				
	Q-Value	59.95230±13	Co^{60} (β^-)	Ni^{60}	Ni^{60} = 59.94923±15	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{27}Co^{61}$					
	Fermi Formula	60.95514			
	Q-Value	60.95137±16	Cu^{65} (γ, α) Co^{61}	Ni^{61} = 60.94983±60	H. E. Duckworth NYO-981 4-18-52
			Ni^{62} (γ, p) Co^{61}	Ni^{62} = 61.94715±20	
			Co^{61} (β^-) Ni^{61}	Cu^{65} = 64.94750±18	
$_{28}Ni^{58}$					
	Fermi Formula	57.95942			
	Mass Spectra	57.95354±23	COH - C_2H_5 - Ni^{58}	H = 1.008142± 3 C = 12.003804±17	H. E. Duckworth and R. S. Preston, Phys. Rev. 79, 402 (1950); NYO-678, 11-20-50 NYO-677, 4-25-50 H. E. Duckworth NYO-981, 4-18-52
		57.95345±10	C_4H_{10} - Ni^{58}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 86, 408 (1952)
	Weighted Mean Duckworth and Collins et al	57.95349± 9			B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{28}Ni^{59}$					
	Fermi Formula	58.95844			
	Q-Value	58.95273±13	Ni^{58} (n, γ) Ni^{59}	Ni^{58} = 57.95354±23	H. E. Duckworth NYO-981 4-18-53
		*58.95273±10	Co^{59} (p, n) Ni^{59}	Co^{59} = 58.95157±10 Δm = 0.001155±3	J. J. G. McCue and W. M. Preston Phys. Rev. 84, 384 (1951)
$_{28}Ni^{60}$					
	Fermi Formula	59.95471			
	Mass Spectra	59.94923±15	Si^{30} - Ni^{60}	Si^{30} = 29.98327± 5	H. E. Duckworth NYO-981 4-18-52
		59.94977±35	C_5 - Ni^{60}	C = 12.003871±33	T. Okuda et al Phys. Rev. 59, 104 (1941)
		59.94901±29	C_5 - Ni^{60}	C = 12.003842± 4	T. L. Collins et al Phys. Rev. 86, 408 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{28}Ni^{60}$	Weighted Mean Duckworth and Collins et al	59.94925±13		C = 12.003842± 4	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
$_{28}Ni^{61}$	Fermi Formula	60.95493			
	Q-Value	60.94983±60	Ni^{60} (n, γ) Ni^{61}	Ni^{60} = 59.94923±15	H. E. Duckworth NYO-981 4-18-52
	Mass Spectra	60.94907±23	C_5H - Ni^{61}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 86, 408 (1952)
		60.95084±45	Ni^{61} - W^{183}	W^{183} = 183.0073 ±12	Duckworth says value "not too good" H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet		Reference Masses	References
$_{28}Ni^{62}$						
	Fermi Formula	61.95242				
	Q-Value	61.94707±26	Cu^{63} (γ, n)	Cu^{62}	Cu^{63} = 62.94854±18	H. E. Duckworth NYO-981 4-18-52
			Cu^{62} (β^+)	Ni^{62}		
	Mass Spectra	61.94738±26	Ni^{62} -	Sn^{124}	Sn^{124} = 123.94262±55	H. E. Duckworth NYO-981 4-18-52
		61.94681± 9	C_5H_2 -	Ni^{62}	H = 1.008146±3 C = 12.003842±4	T. L. Collins et al Phys. Rev. 86, 408 (1952)
	Weighted Mean of Duckworth values	61.94715±20				
$_{28}Ni^{63}$						
	Fermi Formula	62.95372				
	Q-Value	62.94861±17	Ni^{63} (β^-)	Cu^{63}	Cu^{63} = 62.94854±16	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{28}Ni^{64}$	Fermi Formula	63.95233			
	Mass Spectra	63.94726±16	O^{16} - 1/4 Ni^{64}	O = 16.00000	H. E. Duckworth NYO-981 4-18-52
		63.94740±56	C_5H_4 - Ni^{64}	H = 1.008131± 3.3 C = 12.003871±33	T. Okuda et al Phys. Rev. 59, 104 (1941)
		63.94755± 7	SO_2 - Ni^{64}	S = 31.982236± 7	T. L. Collins et al Phys. Rev. 86, 408 (1952)
$_{28}Ni^{65}$	Fermi Formula	64.95461			
	Q-Value	64.94976±19	Ni^{65} (β^-) Cu^{65}	Cu^{65} = 64.94750 ±18	H. E. Duckworth NYO-981 4-18-52
$_{29}Cu^{60}$	Fermi Formula	59.96222			
	Q-Value	59.95387±25	Cu^{60} (β^+) Ni^{60}	Ni^{60} = 59.94923 ±15	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{29}Cu^{61}$	Fermi Formula	60.95775			
	Q-Value	60.95223±18	Cu^{61} (β^+) Ni^{61}	Ni^{61} = 60.94983±60	H. E. Duckworth NYO-981 4-18-52
$_{29}Cu^{62}$	Fermi Formula	61.95721			
	Q-Value	61.95130±20	Cu^{62} (β^+) Ni^{62}	Ni^{62} = 61.94715±20	H. E. Duckworth NYO-981 4-18-52
$_{29}Cu^{63}$	Fermi Formula	62.95399			
	Q-Value	62.94854±16	Zn^{64} (γ, n) Zn^{63} Zn^{63} (β^+) Cu^{63} Ni^{63} (β^-) Cu^{63} Cu^{63} (n, γ) Cu^{64}	Ni^{64} = 63.94726±16	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet		Reference Masses	References
$_{29}Cu^{63}$	Q-Value	62.94854±16	Cu^{63} (d, p)	Cu^{64}		
			Cu^{64} (β^+)	Ni^{64}		
			Cu^{64} (β^-)	Zn^{64}		
	Mass Spectra	62.94926±6	C_5H_3 -	Cu^{63}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 86, 408 (1952)
$_{29}Cu^{64}$	Fermi Formula	63.95455				
	Q-Value	63.94904±17	Cu^{64} (β^-)	Zn^{64}	Zn^{64} = 63.94844 ±16	H. E. Duckworth NYO-981 4-18-52
			Cu^{64} (β^+)	Ni^{64}	Ni^{64} = 63.94726 ±16	
$_{29}Cu^{65}$	Fermi Formula	64.95247				
	Q-Value	64.94750±18	Zn^{64} (d, p)	Zn^{65}	Ni^{64} = 63.94726 ±16	H. E. Duckworth NYO-981 4-18-52
			Zn^{65} (β^+)	Cu^{65}		
			Cu^{65} (γ, n)	Cu^{64}		
			Cu^{64} (β^+)	Ni^{64}		
			Cu^{64} (β^-)	Zn^{64}		

	Method	Mass	Reaction or Doublet	Reference Masses		References
$_{29}Cu^{65}$	Mass Spectra	64.94851±32	Cu^{65} - Pt^{195}	Pt^{195} =	195.02588 ±78	H. E. Duckworth NYO-981 4-18-52 Cu^{65} - Pt^{195} Δf Believed to be in error by Duckworth.
		64.94835± 6	C_5H_5 - Cu^{65}	H = 1.008146± 3 C = 12.003842± 4		T. L. Collins et al Phys. Rev. 86, 408 (1952)
$_{30}Zn^{62}$	Fermi Formula	61.95847				
	Q-Value	61.95312±22	Zn^{62} (β^+) Cu^{62}	Cu^{62} =	61.95130 ± 2	H. E. Duckworth NYO-981 4-18-52
$_{30}Zn^{63}$	Fermi Formula	62.95721				
	Q-Value	62.95205±23	Zn^{63} (β^+) Cu^{63}	Cu^{63} =	62.94854 ±16	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{30}Zn^{64}$	Fermi Formula	63.95333			
	Q-Value	63.94844±16	Cu^{64} (β^+) Ni^{64} Cu^{64} (β^-) Zn^{64}	Ni^{64} = 63.94726 ±16	H. E. Duckworth NYO-981 4-18-52
	Mass Spectra	63.94955± 2	SO_2 - Zn^{64} O_2 - 1/2 Zn^{64}	S = 31.982236± 7	T. L. Collins et al Phys. Rev. 86, 406 (1952)
		63.95365±66	C_5H_4 - Zn^{64}	H = 1.008131± 3.3 C = 12.003871±33	K. Ogata Phys. Rev. 75, 200 (1949)
$_{30}Zn^{65}$	Fermi Formula	64.95320			
	Q-Value	64.94892±17	Zn^{65} (β^+) Cu^{65}	Cu^{65} = 64.94750 ±18	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{30}Zn^{66}$					
	Fermi Formula	65.95048			
	Q-Value	65.94591±27	Zn^{64} (d, p) Zn^{65} Zn^{66} (n, γ) Zn^{65}	Zn^{64} = 63.94844±16	H. E. Duckworth NYO-981 4-18-52
	Mass Spectra	65.94676±42	C_5H_6 - Zn^{66}	H = 1.008131± 3.3 C = 12.003871±33	K. Ogata Phys. Rev. 75, 200 (1949)
		65.94722± 6	C_5H_6 - Zn^{66}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 86, 408 (1952)
$_{30}Zn^{67}$					
	Fermi Formula	66.95138			
	Q-Value	66.94737±34	Zn^{64} (d, p) Zn^{65} Zn^{67} (γ, n) Zn^{66}	Zn^{64} = 63.94844 ±16	H. E. Duckworth NYO-981 4-18-52
	Mass Spectra	66.94826±38	C_5H_7 - Zn^{67}	H = 1.008131± 3.3 C = 12.003871±33	K. Ogata Phys. Rev. 75, 200 (1949)
		66.94815± 6	C_5H_7 - Zn^{67}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 86, 408 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{30}Zn^{68}$					
	Fermi Formula	67.94972			
	Q-Value	67.94545±40	Zn^{64} (d, p) Zn^{65} Zn^{68} (γ, n) Zn^{67}	Zn^{64} = 63.94844±16	H. E. Duckworth NYO-981 4-18-52
	Mass Spectra	67.94885±65	C_5H_8 - Zn^{68}	H = 1.008131± 3.3 C = 12.003871±33	K. Ogata Phys. Rev. 75, 200 (1949)
		67.94686± 7	C_5H_8 - Zn^{68}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 86, 408 (1952)
$_{30}Zn^{69}$					
	Fermi Formula	68.95156			
	Q-Value	68.94761±45	Zn^{69} (β^-) Ga^{69}	Ga^{69} = 68.94669 ±45	H. E. Duckworth NYO-981 4-18-52
$_{30}Zn^{70}$					
	Fermi Formula	69.95086			
	Q-Value	69.94671±50	Zn^{70} (γ, n) Zn^{69} Zn^{69} (β^-) Ga^{69}	Ga^{69} = 68.94669 ±45	H. E. Duckworth NYO-981 4-18-52
	Mass Spectra	69.94779± 6	C_5H_{10} - Zn^{70}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins et al Phys. Rev. 86, 408 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{31}Ga^{68}$					
	Fermi Formula	67.95277			
	Q-Value	67.94856±41	Ga^{68} (β^+) Zn^{68}	Zn^{68}= 67.94545±40	H. E. Duckworth NYO-981 4-18-52
$_{31}Ga^{69}$					
	Fermi Formula	68.95046			
	Q-Value	68.94810±22	Ga^{69} (γ, n) Ga^{68} Ga^{68} (β^+) Zn^{68}	Zn^{68}= 67.94686± 7	B. G. Hogg and H. E. Duckworth
		68.94777±22	Zn^{70} (γ, n) Zn^{69} Zn^{69} (β^-) Ga^{69}	Zn^{70}= 69.94779± 6	Can. J. Phys. 31,
	Mass Spectra	68.9480 ± 4	Ga^{69} - 1/3 Pb^{207}	Pb^{207}=207.0405 ±10	942,
	Weighted Mean	68.94794±16			(1953)
	Mass Spectra and Q-Values				
$_{31}Ga^{72}$					
	Fermi Formula	71.95238			
	Q-Value	71.9474 ± 6	Ga^{72} (β^-) Ge^{72}	Ge^{72}= 71.9431 ±6	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{32}Ge^{70}$	Fermi Formula	69.94914			
	Q-Value and Mass Spectra	69.9460 ± 5	$2\,Ge^{70}$ - Ce^{140} Ti^{47} - Pr^{141} $Pr^{141}(\gamma, n)Pr^{140}$ $Pr^{140}(\beta^{+})\,Ce^{140}$	Δm = 56.8± 6 mmu Ti^{47} = 46.9668	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942, (1953)
	Microwave Spectra	69.9464 ± 7	GeH_3Cl^{35}	Ge^{72}= 71.94493±20 Ge^{74}= 73.9447 ± 4	Value computed by B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953) From data by S. Geschwind and R. Gunther-Mohr Phys. Rev. 81, 882 (1951)
	Weighted Mean From Hogg and Duckworth values	69.9461 ± 4			B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{32}Ge^{72}$					
	Fermi Formula	71.94777			
	Mass Spectra	71.94493±20	Ti^{48} - Nd^{144} - Ge^{72}	Ti^{48} = 47.96317± 6	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
	Microwave Spectra	71.94848±40	$Ge\,H_3\,Cl$	Ge^{70} = 69.94952 Ge^{74} = 73.94862 (Bohr-Wheeler formula)	S. Geschwind and R. Gunther-Mohr Phys. Rev. 81, 882 (1951)
$_{32}Ge^{74}$					
	Fermi Formula	73.94824			
	Q-Value	73.9447 ± 4	As^{75} (γ, n) As^{74} As^{74} (β^+) Ge^{74}	As^{75} = 74.9454 ±30	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942, (1953)
	Microwave Spectra	73.9426 ± 9	$Ge\,H_3\,Cl^{35}$	Ge^{70} = 69.9447 ± 6 Ge^{72} = 71.9430 ± 6	H. E. Duckworth et al Phys. Rev. 83, 1114 (1951); NYO-680, 5-30-51 NYO-981, 4-18-52, using data by S. Geschwind and R. Gunther-Mohr Phys. Rev. 81, 882 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{32}Ge^{76}$					
	Fermi Formula	75.95040			
	Mass Spectra	75.9462 ± 4	Ge^{76} - Se^{76}	Se^{76} = 75.94324±18	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
	Microwave Spectra	75.9456 ± 7	$Ge\,H_3\,Cl^{35}$	Ge^{72} = 71.94493±20 Ge^{74} = 73.9447 ± 4	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953) From data by S. Geschwind and R. Gunther-Mohr Phys. Rev. 81, 882 (1951)
		75.94994±40	$Ge\,H_3\,Cl^{35}$	Ge^{70} = 69.94952 Ge^{74} = 73.94862 (Bohr-Wheeler formula)	S. Geschwind and R. Gunther-Mohr Phys. Rev. 81, 882 (1951)
	Weighted Mean Hogg and Duckworth values	75.9460 ± 4			B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{32}Ge^{77}$					
	Fermi Formula	76.95345			
	Q-Value	76.9459 ±12	Ge^{77} (β^-) As^{77}	As^{77} = 76.9429 ±12	H. E. Duckworth NYO-981 4-18-52
$_{33}As^{74}$					
	Fermi Formula	73.94990			
	Q-Value	73.9452 ±10	As^{74} (β^-) Se^{74} As^{74} (β^+) Ge^{74}	Se^{74} = 73.9437 ±10 Ge^{74} = 73.9424 ±10	H. E. Duckworth NYO-981 4-18-53
$_{33}As^{75}$					
	Fermi Formula	74.94832			
	Mass Spectra	74.94522±30	3 Ti^{50} -2 As^{75}	Ti^{50} = 49.96077 ± 4	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
	Adjusted Value	74.9454 ± 3	As^{75} (n, γ) As^{76}	Se^{76} = 75.94324 ±18	To agree with best value by Hogg and Duckworth for Se^{76} Can. J. Phys. 31, 942 (1953)
$_{33}As^{76}$					
	Fermi Formula	75.94999			
	Q-Value	75.9443 ±12	As^{76} (β^-) Se^{76}	Se^{76} = 75.9410 ±12	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{33}As^{77}$					
	Fermi Formula	76.94929			
	Q-Value	76.9429 ±12	As^{77} (β^-) Se^{77}	Se^{77} = 76.9421 ±12	H. E. Duckworth NYO-981 4-18-52
$_{34}Se^{74}$					
	Fermi Formula	73.94839			
	Q-Value	73.9460 ± 4	As^{75} (γ, n) As^{74} As^{74} (β^-) Se^{74}	As^{75} = 74.9454 ± 3	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942, (1953)
	Microwave Spectra	73.9481 ± 6	OC Se	Se^{76} = 75.9465 Se^{80} = 79.9478 (Bohr-Wheeler formula)	S. Geschwind et al Phys. Rev. 78, 174 (1950)
$_{34}Se^{76}$					
	Fermi Formula	75.94648			
	Q-Value	75.94301±30	As^{75} (n, γ) As^{76} As^{76} (β^-) Se^{76}	As^{75} = 74.9454 ± 3	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942, (1953)
		75.94337±22	Se^{77} (γ, n) Se^{76}	Se^{77} = 76.9442 ± 2	
	Weighted Mean	75.94324±18			
	Hogg and Duckworth values				

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{34}Se^{77}$					
	Fermi Formula	76.94757			
	Q-Value	76.9442 ± 2	Se^{78} (γ, n) Se^{77} Se^{77} (γ, n) Se^{76}	Se^{78} = 77.9420 ± 2 Se^{76} = 75.94324±18	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
	Microwave Spectra	76.9482 ± 4	OC Se	Se^{76} = 75.9465 Se^{80} = 79.9478 (Bohr-Wheeler formula)	S. Geschwind et al Phys. Rev. 78, 174 (1950)
$_{34}Se^{78}$					
	Fermi Formula	77.94632			
	Mass Spectra	77.94210±22	Cr^{52} = Se^{78} - Gd^{156}	Cr^{52} = 51.95707 ± 9	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
	Adjusted Value	77.9420 ± 2	Se^{78} (γ, n) Se^{77} Se^{77} (γ, n) Se^{76}	Se^{76} = 75.94324 ±18	To agree with best value by Hogg and Duckworth for Se^{76}
	Microwave Spectra	77.9465 ± 4	OC Se	Se^{76} = 75.9465 Se^{80} = 79.9478 (Bohr-Wheeler formula)	S. Geschwind et al Phys. Rev. 78, 174 (1950)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{34}Se^{80}$	Fermi Formula	79.94780			
	Microwave Spectra	79.9421 ± 6	OC Se	Se^{74} = 73.9460 ± 4 Se^{78} = 77.9420 ± 2	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953) Using data from S. Geschwind et al, Phys. Rev. 78, 174 (1950)
$_{34}Se^{82}$	Fermi Formula	81.95079			
	Microwave Spectra	81.9431 ± 6	OC Se	Se^{74} = 73.9460 ± 4 Se^{78} = 77.9420 ± 2	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953) Using data from S. Geschwind et al, Phys. Rev. 78, 174 (1950)
		81.9500 ± 6	OC Se	Se^{76} = 75.9465 Se^{80} = 79.9478 (Bohr-Wheeler formula)	S. Geschwind et al Phys. Rev. 78, 174 (1950)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{35}Br^{79}$					
	Fermi Formula	78.94699			
	Q-Value	78.9435 ± 4	Se^{78} (p, n) Br^{78} Br^{79} (γ, n) Br^{78}	Se^{78} = 77.9420 ± 2	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
	Mass Spectra	78.94438±50	C_3H_3 - 1/2 Br^{79}	H = 1.008131± 3.3 C = 12.003871±33	K. Ogata Phys. Rev. 75, 200 (1949)
	Time-of-Flight	78.944 ± 1	$C_2H_4Br^+$ with C_6H_6, C_8H_{10} standards	H = 1.0081386 C = 12.003895 (Bainbridge)	E. E. Hays et al Phys. Rev. 84, 824 (1951)
$_{35}Br^{80}$					
	Fermi Formula	79.94831			
	Q-Value	79.9426 ±12	Br^{80} (β^+) Se^{80}	Se^{80} = 79.9400 ±12	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{35}Br^{81}$					
	Fermi Formula	80.94734			
	Q-Value	80.9425 ± 5	Se^{80} (p, n) Br^{80} Br^{81} (γ, n) Br^{80} Se^{82} (γ, n) Se^{81} Se^{81} (β^-) Br^{81}	Se^{80} = 79.9421 ± 6 Se^{82} = 81.9431 ± 6	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
	Mass Spectra	80.94228±38	C_3H_4 - 1/2 Br^{81}	H = 1.008131 ± 3.3 C = 12.003871 ±33	K. Ogata Phys. Rev. 75, 200 (1949)
	Time-of-Flight	80.943 ± 1	$C_2H_4Br^+$ with C_6H_6, C_8H_8 as standards	H = 1.0081386 C = 12.003895 (Bainbridge)	E. E. Hays et al Phys. Rev. 84, 824 (1951)
$_{35}Br^{82}$					
	Fermi Formula	81.94942			
	Q-Value	81.94181±35	Br^{82} (β^-) Kr^{82}	Kr^{82} = 81.93843 ±29	H. E. Duckworth NYO-981 4-18-52
$_{35}Br^{84}$					
	Fermi Formula	83.95202			
	Q-Value	83.94353±30	Br^{84} (β^-) Kr^{84}	Kr^{84} = 83.93850 ±29	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{36}Kr^{78}$	Fermi Formula	77.94822			
	Mass Spectra	77.94519±18	C_3H_3 - Kr^{78}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins NBS circ 522 1-23-53 Calculated from Δf by B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
$_{36}Kr^{80}$	Fermi Formula	79.94580			
	Mass Spectra	79.94246±11	C_3H_4 - Kr^{80}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins NBS circ 522 1-23-53 Calculated from Δf by B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{36}Kr^{82}$					
	Fermi Formula	81.94508			
	Mass Spectra	81.93961±11	C_3H_5 - Kr^{82}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins NBS circ 522 1-23-53 Calculated from Δf by B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
		81.9392 ± 4	$2C_3H_5$ - Kr^{82}	H = 1.008146± 3 C = 12.003842± 4	Remeasurement of old plates - B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
$_{36}Kr^{83}$					
	Fermi Formula	82.94663			
	Mass Spectra	82.9419 ± 5	C_3H_5 - Kr^{83}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins NBS circ 522 1-23-53 Calculated from Δf by B. G. Hogg and by H. E. Duckworth Can. J. Phys. 31, 942 (1953)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{36}Kr^{84}$	Fermi Formula	83.94594			
	Mass Spectra	83.93836 ± 9	C_3H_6 - Kr^{84}	H = 1.008146 ± 3 C = 12.003842 ± 4	T. L. Collins NBS circ 522 1-23-53 Calculated from Δf by B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
		83.9382 ± 4	$2C_3H_6$ - Kr^{84}	H = 1.008146 ± 3 C = 12.003842 ± 4	Remeasurement of old plates - B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
	Time-of-Flight	83.938 ± 1	Kr^+ with C_6H_6, C_8H_9 standards	H = 1.0081386 C = 12.003895	E. E. Hays et al Phys. Rev. 84, 824 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{36}Kr^{86}$	Fermi Formula	85.94825			
	Mass Spectra	85.93820±8	C_3H_7 - Kr^{86}	H = 1.008146± 3 C = 12.003842± 4	T. L. Collins NBS circ 522 1-23-53 Calculated from Δf by B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
		85.9384 ±4	Kr^{86} - 2/3 Xe^{129}	Xe^{129} = 128.94594± 15	Remeasurement of old plates - B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{37}Rb^{85}$					
	Fermi Formula	84.94609			
	Time-of-Flight	84.931±1.5 mmu	Rb^+ with C_6H_{12} standard	H = 1.0081386 C = 12.003895	E. E. Hays et al Phys. Rev. 84, 824 (1951) Hogg and Duckworth, Can. J. Phys. 31, 942 (1953) say this value is inconsistent with other masses determined in this region.
$_{37}Rb^{87}$					
	Fermi Formula	86.94736			
	Time-of-Flight	86.9295±20	Rb^+ with Rb^{85} standard	Rb^{85} = 84.931±1.5	E. E. Hays et al Phys. Rev. 84, 824 (1951) Hogg and Duckworth, Can. J. Phys. 31, 942 (1953) say this value is inconsistent with other masses determined in this region.

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{38}Sr^{85}$					
	Fermi Formula	84.94621			
	Q-Value	84.93655±56	Sr^{86} (γ, n) Sr^{85}	Sr^{86} = 85.93533 ±52	H. E. Duckworth NYO-981 4-18-52
$_{38}Sr^{86}$					
	Fermi Formula	85.94449			
	Mass Spectra	85.93552±52	C_3H_7 - Sr^{86} C_2OH_3- Sr^{86}	H = 1.008146 ± 3 C = 12.003842± 4	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
	Adjusted Value	85.9366 ± 6		To agree with transmutation data in this region.	
$_{38}Sr^{87}$					
	Fermi Formula	86.94571			
	Q-Value	86.9365 ± 4	Sr^{86} (d, p) Sr^{87} Sr^{87} (γ, n) Sr^{88}	Sr^{86} = 85.9366 ± 6 Sr^{88} = 87.9335 ± 4	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{38}Sr^{88}$					
	Fermi Formula	87.94477			
	Mass Spectra	87.93364±35	CO_2 - Sr^{88}	C = 12.003842± 4	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
	Adjusted Value	87.9335 ± 4		To agree with transmutation data in this region.	
$_{38}Sr^{89}$					
	Fermi Formula	88.94669			
	Q-Value	88.93554±43	Sr^{88} (d, p) Sr^{89}	Sr^{88} = 87.93356± 35	H. E. Duckworth NYO-981 4-18-52
$_{38}Sr^{90}$					
	Fermi Formula	89.94647			
	Q-Value	89.93595±32	Sr^{90} (β^-) Y^{90}	Y^{90} = 89.93537± 32	H. E. Duckworth NYO-981 4-18-52
$_{38}Sr^{91}$					
	Fermi Formula	90.94904			
	Q-Value	90.93941±33	Sr^{91} (β^-) Y^{91}	Y^{91} = 90.93597± 33	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{39}Y^{88}$					
	Fermi Formula	87.94694			
	Q-Value	87.93851±36	Y^{88} (β^+) Sr^{88}	Sr^{88} = 87.93356± 35	H. E. Duckworth NYO-981 4-18-52
$_{39}Y^{89}$					
	Fermi Formula	88.94550			
	Q-Value	88.9336 ± 4	Sr^{89} (β^-) Y^{89} Zr^{89} (β^+) Y^{89} Sr^{88} (d, p)Sr^{89} Zr^{90} $(\gamma, n)Zr^{89}$	Sr^{88} = 87.9335 ± 4 Zr^{90} = 89.9330 ± 4	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
$_{39}Y^{90}$					
	Fermi Formula	89.94690			
	Q-Value	89.93537±32	Y^{90} (β^-) Zr^{90}	Zr^{90} = 89.93303± 30	H. E. Duckworth NYO-981 4-18-52
$_{39}Y^{91}$					
	Fermi Formula	90.94619			
	Q-Value	90.93597±33	Y^{91} (β^-) Zr^{91}	Zr^{91} = 90.93432± 31	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{40}Zr^{89}$					
	Fermi Formula	88.94646			
	Q-Value	88.93693±45	Zr^{89} (β^+) Y^{89}	Y^{89} = 88.93390±44	H. E. Duckworth NYO-981 4-18-52
$_{40}Zr^{90}$					
	Fermi Formula	89.94454			
	Mass Spectra	89.93286±36	Si^{30} - Zr^{90}	Si^{30} = 29.98327± 5	H. E. Duckworth NYO-981 4-18-52
	Adjusted Value	89.9330 ± 4			To agree with transmutation data in this region. B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
$_{40}Zr^{91}$					
	Fermi Formula	90.94545			
	Q-Value	90.9343 ± 4	Zr^{90} (d, p) Zr^{91}	Zr^{90} = 89.9330 ± 4	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{40}Zr^{92}$					
	Fermi Formula	91.94428			
	Q-Value	91.9339 ± 4	Zr^{91} (d, p) Zr^{92}	Zr^{91} = 90.9343 ± 4	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
$_{40}Zr^{93}$					
	Fermi Formula	92.94587			
	Q-Value	92.93586±36	Zr^{92} (d, p) Zr^{93}	Zr^{92} = 91.93393±34	H. E. Duckworth NYO-981 4-18-52; B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953); J. S. Geiger et al Phys. Rev. 89, 621 (1953)
$_{40}Zr^{94}$					
	Fermi Formula	93.94540			
	Mass Spectra	93.9365 ± 5	1/2 Os^{188} - Zr^{94} 1/2 Os^{188} - Mo^{94}	Mo^{94} = 93.9353 ± 4	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{40}Zr^{95}$					
	Fermi Formula	94.94763			
	Q-Value	94.9374 ±11	Zr^{95} (β^-) Nb^{95}	Nb^{95}= 94.9362 ±11	H. E. Duckworth NYO-981 4-18-52
$_{40}Zr^{96}$					
	Fermi Formula	95.94781			
	Mass Spectra	95.9394 ± 5	1/2 Os^{192}-Zr^{96} 1/2 Os^{192}-Mo^{96}	Mo^{96}= 95.9358 ± 4	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
$_{40}Zr^{97}$					
	Fermi Formula	96.95064			
	Q-Value	96.94187±45	Zr^{97} (β^-) Nb^{97} Nb^{97} (β^-) Mo^{97}	Mo^{97}= 96.93716 ±45	H. E. Duckworth NYO-981 4-18-52
$_{41}Nb^{92}$					
	Fermi Formula	91.94722			
	Q-Value	91.9354 ±10	Nb^{93} (γ, n) Nb^{92}	Nb^{93}= 92.9350 ±10	H. E. Duckworth NYO-981 4-18-52
		91.9360 ± 4	Nb^{93} (γ, n) Nb^{92}	Nb^{93}= 92.9356 ± 4	J. S. Geiger et al Phys. Rev. 89, 621 (1953); B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)

	Method	Mass	Reaction or Doublet		Reference Masses	References
$_{41}Nb^{93}$						
	Fermi Formula	92.94556				
	Q-Value	92.9356 ± 4	Nb^{93} (γ, n)	Nb^{92}	Zr^{92} = 91.9339 ± 4	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
			Zr^{92} (d, p)	Zr^{93}		
			Zr^{93} (β^-)	Nb^{93}		
$_{41}Nb^{94}$						
	Fermi Formula	93.94666				
	Q-Value	93.9362 ± 10	Nb^{94} (β^-)	Mo^{94}	Mo^{94} = 93.9348 ± 10	H. E. Duckworth NYO-981 4-18-52
$_{41}Nb^{95}$						
	Fermi Formula	94.94572				
	Q-Value	94.9362 ± 11	Nb^{95} (β^-)	Mo^{95}	Mo^{95} = 94.9352 ± 11	H. E. Duckworth NYO-981 4-18-52
$_{41}Nb^{97}$						
	Fermi Formula	96.94720				
	Q-Value	96.93902 ± 44	Zr^{97} (β^-)	Nb^{97}	Zr^{97} = 96.94187 ± 45	H. E. Duckworth NYO-981 4-18-52
			Nb^{97} (β^-)	Mo^{97}	Mo^{97} = 96.93716 ± 45	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{42}Mo^{92}$					
	Fermi Formula	91.94739			
	Mass Spectra	91.9352 ± 4	Mo^{92} - 1/2 W^{184} Zr^{92} - 1/2 W^{184}	Zr^{92} = 91.9339 ± 4	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
$_{42}Mo^{93}$					
	Fermi Formula	92.94731			
	Q-Value	92.9353 ± 4	Mo^{92} (d, p) Mo^{93}	Mo^{92} = 91.9352 ± 4	J. S. Geiger et al Phys. Rev. 89, 621 (1953) B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
$_{42}Mo^{94}$					
	Fermi Formula	93.94520			
	Q-Value	93.9353 ± 4	Nb^{93} (d, p) Nb^{94} Nb^{94} (β^-) Mo^{94}	Nb^{93} = 92.9356 ± 4	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
	Mass Spectra	93.9348 ± 10	Pr^{141} - Mo^{94}	Pr^{141} = 140.9521 ± 14	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{42}Mo^{95}$					
	Fermi Formula	94.94583			
	Q-Value	94.9352 ±11	Mo^{95} (γ, n) Mo^{94}	Mo^{94} = 93.9348 ±10	H. E. Duckworth NYO-981 4-18-52
$_{42}Mo^{96}$					
	Fermi Formula	95.94444			
	Mass Spectra	95.9358 ± 4	C_2 - Mo^{96}	C = 12.003842± 4	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
$_{42}Mo^{97}$					
	Fermi Formula	96.94573			
	Q-Value	96.93716±45	Mo^{97} (γ, n) Mo^{96}	Mo^{96} = 95.93559 ± 38	H. E. Duckworth NYO-981 4-18-52
$_{42}Mo^{98}$					
	Fermi Formula	97.94502			
	Mass Spectra	97.93584±44	Mo^{98} - Pt^{196}	Pt^{196} = 196.02691 ± 62	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction and Doublet	Reference Masses	References
$_{42}Mo^{99}$					
	Fermi Formula	98.94694			
	No Method Given	98.93838±45			H. E. Duckworth NYO-981 4-18-52
$_{42}Mo^{100}$					
	Fermi Formula	99.94686			
	Mass Spectra	99.93830±40	$1/4\ C_2H$ - Mo^{100}	H = 1.008142± 3 C = 12.003804± 17	H. E. Duckworth NYO-981 4-18-52
$_{43}Tc^{94}$					
	Fermi Formula	93.95055			
	Q-Value	93.9394 ±10	Tc^{94} (β^+) Mo^{94}	Mo^{94} = 93.9348 ± 10	H. E. Duckworth NYO-981 4-18-52
$_{43}Tc^{95}$					
	Fermi Formula	94.94796			
	Q-Value	94.9367 ±10	Tc^{95} ($K\beta^+$) Mo^{95}	Mo^{95} = 94.9352 ± 11	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{43}Tc^{99}$					
	Fermi Formula	98.94591			
	Q-Value	98.93691±43	Mo^{99} (β^-) Tc^{99}	Mo^{99} = 98.93838±45	H. E. Duckworth NYO-981 4-18-52
$_{44}Ru^{96}$					
	Fermi Formula	95.94908			
	Mass Spectra	95.9388 ± 4	1/2 Os^{192} - Ru^{96} 1/2 Os^{192} - Mo^{96}	Mo^{96} = 95.9358± 4	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
$_{44}Ru^{99}$					
	Fermi Formula	98.94683			
	Q-Value*	98.93366	Tc^{99} (β^-) Ru^{99}	Tc^{99} = 98.93691±43	H. E. Duckworth NYO-981 4-18-52
$_{44}Ru^{103}$					
	Fermi Formula	102.94693			
	Q-Value	102.93858±70	Ru^{103} (β^-) Rh^{103}	Rh^{103} = 102.93779±69	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses		References
$_{44}Ru^{106}$						
	Fermi Formula	105.94909				
	Q-Value	105.94073±53	Ru^{106} (β^-) Rh^{106}	Rh^{106} =	105.94031±52	H. E. Duckworth NYO-981 4-18-52
$_{45}Rh^{102}$						
	Fermi Formula	101.94811				
	Q-Value	101.93885±72	Rh^{103} (γ, n) Rh^{102}	Rh^{103} =	102.93779±69	H. E. Duckworth NYO-981 4-18-52
$_{45}Rh^{103}$						
	Fermi Formula	102.94675				
	Q-Value	102.93779±69	Rh^{103} (d, p) Rh^{104} Rh^{104} (β^-) Pd^{104}	Pd^{104} =	103.93667±64	H. E. Duckworth NYO-981 4-18-52
$_{45}Rh^{104}$						
	Fermi Formula	103.94792				
	Q-Value	103.93946±65	Rh^{104} (β^-) Pd^{104}	Pd^{104} =	103.93667±64	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{45}Rh^{106}$					
	Fermi Formula	105.94894			
	Q-Value	105.94031±52	Rh^{106} (β^-) Pd^{106}	Pd^{106} = 105.93650±51	H. E. Duckworth NYO-981 4-18-52
$_{46}Pd^{102}$					
	Fermi Formula	101.94832			
	Mass Spectra	101.93750± 9	C_4H_3 - 1/2 Pd^{102}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
$_{46}Pd^{104}$					
	Fermi Formula	103.94666			
	Mass Spectra	103.93655±11	C_4H_4 - 1/2 Pd^{104}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
		103.93667±64	C_2H_2 - 1/4 Pd^{104}	H = 1.008142± 3	H. E. Duckworth NYO-981 4-18-52
			Cr^{52} - 1/2 Pd^{104}	C = 12.003804±17 Cr^{52} = 51.95696 ±21	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{46}Pd^{105}$					
	Fermi Formula	104.94740			
	Q-Value	104.93792±67	Pd^{105} (γ, n) Pd^{106}	Pd^{106} = 105.93650±51	H. E. Duckworth NYO-981 4-18-52
	Mass Spectra	104.93830±15	C_8H_9 - Pd^{105}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
$_{46}Pd^{106}$					
	Fermi Formula	105.94626			
	Mass Spectra	105.93650±51	Cr^{53} - Pd^{106}	Cr^{53} = 52.95770±20	H. E. Duckworth NYO-981 4-18-52
		105.93680±19	C_4H_5 - Pd^{106} C_8H_{10} - Pd^{106}	H = 1.008146 C = 1.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{46}Pd^{108}$					
	Fermi Formula	107.94706			
	Mass Spectra	107.93685±40	C_2H_3 - 1/4 Pd^{108}	H = 1.008142± 3	H. E. Duckworth NYO-981 4-18-52
			Fe^{54} - 1/2 Pd^{108}	C = 12.003804±17 Fe^{54} = 53.95653 ±22	
		107.93801±11	C_4H_6 - 1/2 Pd^{108}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
$_{46}Pd^{109}$					
	Fermi Formula	108.94896			
	Q-Value	108.94058±64	Pd^{109} (β^-) Ag^{109}	Ag^{109} = 108.93956 ±60	H. E. Duckworth NYO-981 4-18-52
$_{46}Pd^{110}$					
	Fermi Formula	109.94900			
	Mass Spectra	109.93965±13	C_4H_7 - 1/2 Pd^{110}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
		109.94042±60	Mn^{55} - 1/2 Pd^{110}	Mn^{55} = 54.95536±15	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{47}Ag^{106}$					
	Fermi Formula	105.94977			
	Q-Value	105.93979±52	Ag^{106} (β^+) Pd^{106}	Pd^{106} = 105.93650±51	H. E. Duckworth NYO-981 4-18-52
$_{47}Ag^{107}$					
	Fermi Formula	106.94821			
	Q-Value and Mass Spectra	106.93851±75	Ag^{107} (γ, n) Ag^{106} Ag^{106} (EC) Pd^{106}	Ag^{109} = 108.93956±60 Ag^{106} = 105.93979±52 Pd^{106} = 105.93650±51	H. E. Duckworth NYO-981 4-18-52
	Adjusted Value	106.93884±60	Ag^{107} (d, p) Ag^{108} Ag^{109} (γ, n) Ag^{108}	To correspond with best value for Ag^{109}, NYO-981	
$_{47}Ag^{108}$					
	Fermi Formula	107.94912			
	Q-Value	107.94030±64	Ag^{107} (d, p) Ag^{108}	Ag^{107} = 106.93884±60	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{47}Ag^{109}$					
	Fermi Formula	108.94817			
	Q-Value and Mass Spectra	108.93956±60	Ag^{107} (d, p) Ag^{108} Ag^{109} (γ, n) Ag^{108} Ag^{109} (n, γ) Ag^{110} Ag^{110} (β^-) Cd^{110}	Ag^{107} = 106.93884±60 Ag^{108} = 107.94030±64 Ag^{110} = 109.94162±60 Cd^{110} = 109.93855±44	H. E. Duckworth NYO-981 4-18-52
$_{47}Ag^{110}$					
	Fermi Formula	109.94965			
	Q-Value	109.94162±60	Ag^{110} (β^-) Cd^{110}	Cd^{110} = 109.93855±44	H. E. Duckworth NYO-981 4-18-52
$_{47}Ag^{113}$					
	Fermi Formula	112.95150			
	Q-Value	112.94300±45	Ag^{113} (β^-) Cd^{113}	Cd^{113} = 112.94174±43	H. E. Duckworth NYO-981 4-18-52
$_{48}Cd^{106}$					
	Fermi Formula	105.95076			
	Mass Spectra	105.93984±14	C_4H_5 - 1/2 Cd^{106}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{48}Cd^{108}$					
	Fermi Formula	107.94868			
	Q-Value	107.9379 ±11	Ag^{108} (β^-) Cd^{108} Ag^{109} (γ, n) Ag^{108}	Ag^{109} = 108.9399 ±10	H. E. Duckworth and R. E. Preston NYO-678 11-20-50
	Mass Spectra	107.93860±11	C_4H_6 - 1/2 Cd^{108}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
$_{48}Cd^{110}$					
	Fermi Formula	109.94784			
	Mass Spectra	109.93855±44	Mn^{55} - 1/2 Cd^{110}	Mn^{55} = 54.95536±15	H. E. Duckworth NYO-981 4-18-52
		109.93857±13	C_4H_7 - 1/2 Cd^{110}	H = 1.008146 C = 12.003842	H. E. Halsted Phys. Rev. 88, 666 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{48}Cd^{111}$					
	Fermi Formula	110.94891			
	Mass Spectra	110.93978±10	C_8H_{15} - Cd^{111}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
$_{48}Cd^{112}$					
	Fermi Formula	111.94816			
	Mass Spectra	111.93885±17	C_4H_8 - 1/2 Cd^{112} C_8H_{16} - Cd^{112}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
		111.93974±40	Fe^{56} - 1/2 Cd^{112}	Fe^{56} = 55.95274±17	H. E. Duckworth NYO-981 4-18-52
$_{48}Cd^{113}$					
	Fermi Formula	112.94979			
	Q-Value	112.94174±43	Cd^{113} (γ, n) Cd^{114}	Cd^{114}=113.93989±48	H. E. Duckworth NYO-981 4-18-52
	Mass Spectra	112.94061±11	C_8H_{17} - Cd^{113}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{48}Cd^{114}$					
	Fermi Formula	113.94960			
	Mass Spectra	113.93989±48	Fe^{57} - 1/2 Cd^{114}	Fe^{57} = 56.95352±17	H. E. Duckworth NYO-981 4-18-52
		113.93997± 9	C_4H_9 -1/2 Cd^{114} C_3H_5O-1/2 Cd^{114}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
$_{48}Cd^{116}$					
	Fermi Formula	115.95209			
	Mass Spectra	115.94202±12	C_3H_6O-1/2 Cd^{116}	H = 1.008146 C^{12} = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
		115.94208±52	Ni^{58} - 1/2 Cd^{116}	Ni^{58} = 57.95354±23	H. E. Duckworth NYO-981 4-18-52

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	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{49}In^{112}$					
	Fermi Formula	111.95095			
	Q-Value	111.94266±41	In^{112} (β^-) Sn^{112} In^{112} (β^+) Cd^{112}	Cd^{112} = 111.93974±40 Sn^{112} = 111.94159±42	H. E. Duckworth NYO-981 4-18-52
$_{49}In^{113}$					
	Fermi Formula	112.94980			
	Mass Spectra	112.94045±12	C_8H_{17} - In^{113}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
$_{49}In^{114}$					
	Fermi Formula	113.95102			
	Q-Value	113.93980±60	In^{114} (β^+) Cd^{114}	Cd^{114} = 113.93989±48	H. E. Duckworth NYO-981 4-18-52
$_{49}In^{115}$					
	Fermi Formula	114.95045			
	Q-Value and Mass Spectra	114.93906±56	In^{115} (d, p) In^{116} In^{116} (β^-) Sn^{116}	Sn^{116} = 115.93779±52	H. E. Duckworth NYO-981 4-18-52
		114.94140±56	In^{115} (γ, n) In^{114} Cd^{114} (p, n) In^{114}	Cd^{114} = 113.93989±48	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{49}In^{115}$	Mass Spectra	114.94040±11	C_9H_7 - In^{115}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
$_{49}In^{116}$	Fermi Formula	115.95219			
	Q-Value	115.94096±53	In^{116} (β^-) Sn^{116}	Sn^{116} = 115.93779±52	H. E. Duckworth NYO-981 4-18-52
$_{49}In^{117}$	Fermi Formula	116.95216			
	Q-Value	116.94143±46	In^{117} (β^-) Sn^{117}	Sn^{117} = 116.93957±45	H. E. Duckworth NYO-981 4-18-52
$_{49}In^{119}$	Fermi Formula	118.95488			
	Q-Value	118.94338±44	In^{119} (β^-) Sn^{119}	Sn^{119} = 118.94048±43	H. E. Duckworth NYO-981 4-18-52
$_{50}Sn^{112}$	Fermi Formula	111.95129			
	Q-Value	111.94159±42	In^{112} (β^-) Sn^{112} In^{112} (β^+) Cd^{112}	Cd^{112} = 111.93974±40 In^{112} = 111.94266±41	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet		Reference Masses	References
$_{50}Sn^{114}$						
	Fermi Formula	113.95003				
	Q-Value	113.9389 ± 9	In^{115} (γ, n)	In^{114}	In^{115} = 114.93984±73	H. E. Duckworth and R. S. Preston NYO-678 11-20-50
			In^{114} (β^-)	Sn^{114}		
$_{50}Sn^{115}$						
	Fermi Formula	114.95085				
	Q-Value	114.93853±56	In^{115} (β^-)	Sn^{115}	In^{115} = 114.93906±56	H. E. Duckworth NYO-981 4-18-52
	Mass Spectra	114.94014	C_9H_7 -	Sn^{115}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
$_{50}Sn^{116}$						
	Fermi Formula	115.94991				
	Mass Spectra	115.93779±52	Ni^{58} - 1/2	Sn^{116}	Ni^{58} = 57.95354±23	H. E. Duckworth NYO-981 4-18-52
		115.93927±11	C_3H_6O -1/2	Sn^{116}	H = 1.008146	R. E. Halsted Phys. Rev. 88, 666 (1952)
			C_9H_8 -	Sn^{116}	C = 12.003842	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{50}Sn^{117}$	Fermi Formula	116.95127			
	Q-Value	116.93957±45	Sn^{117} (d, p) Sn^{118}	Sn^{118} = 117.93849±40	H. E. Duckworth NYO-981 4-18-52
	Mass Spectra	116.94145±47	C_3H_3 - 1/3 Sn^{117}	H = 1.008142± 3 C = 12.003804±17	H. E. Duckworth NYO-981 4-18-52 Duckworth assumes his C_3H_3 - Sn^{117} packing fraction is in error.
		116.94052±10	C_9H_9 - Sn^{117}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
$_{50}Sn^{118}$	Fermi Formula	117.95087			
	Mass Spectra	117.93849±40	Sn^{118} - Co^{59}	Co^{59} = 58.95160±12	H. E. Duckworth NYO-981 4-18-52
		117.93978±16	C_3H_7O - 1/2 Sn^{118} C_9H_{10} - Sn^{118}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{50}Sn^{119}$					
	Fermi Formula	118.95274			
	Q-Value	118.94048±43	Sn^{119} (γ, n) Sn^{118}	Sn^{118} = 117.93849±40	H. E. Duckworth NYO-981 4-18-52
	Mass Spectra	118.94122±12	C_9H_{11} - Sn^{119}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
$_{50}Sn^{120}$					
	Fermi Formula	119.95287			
	Mass Spectra	119.93860±42	Ni^{60} - Sn^{120}	Ni^{60} = 59.94923±15	H. E. Duckworth NYO-981 4-18-52
		119.94059±14	C_5 - 1/2 Sn^{120}	C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
$_{50}Sn^{121}$					
	Fermi Formula	120.95522			
	Q-Value	120.94092± 51	Sn^{121} (β^-) Sb^{121}	Sb^{121} = 120.94040±44	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet		Reference Masses	References
$_{50}Sn^{122}$						
	Fermi Formula	121.95584				
	Mass Spectra	121.94249±15	C_5H - 1/2	Sn^{122}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
		121.94407±85	Ni^{61} - 1/2	Sn^{122}	Ni^{61} = 60.94983±60	H. E. Duckworth NYO-981 4-18-52
$_{50}Sn^{123}$						
	Fermi Formula	122.95865				
	Q-Value	122.94277±54	Sn^{123} (β^-)	Sb^{123}	Sb^{123} = 122.94124±53	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet		Reference Masses			References
$_{50}Sn^{124}$								
	Fermi Formula	123.95975						
	Q-Value	123.94262±55	Sn^{124} (γ, n) Sn^{123} (β^-)	Sn^{123} Sb^{123}	Sb^{123}	=	122.94124±53	H. E. Duckworth NYO-981 4-18-52
	Mass Spectra	123.9489 ±12	Ni^{62} -	Sn^{124}	Ni^{62}	=	61.94822±45	H. E. Duckworth and R. S. Preston NYO-678 11-20-50
		123.94490±11	C_5H_2 - 1/2	Sn^{124}	H C	= =	1.008146 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
$_{51}Sb^{120}$								
	Fermi Formula	119.95374						
	Q-Value	119.94138±44	Sb^{120} (β^+)	Sn^{120}	Sn^{120}	=	119.93860±42	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet		Reference Masses		References
$_{51}Sb^{121}$							
	Fermi Formula	120.95350					
	Q-Value and Mass Spectra	120.94040±44	Sb^{121} (γ, n)	Sb^{120}	Sb^{120}	= 119.94138±44	H. E. Duckworth NYO-981 4-18-52
			Sb^{120} (β^+)	Sn^{120}	Sn^{120}	= 119.93860±42	
			Sn^{120} (d, p)	Sn^{121}	Sn^{121}	= 120.94092±57	
			Sn^{121} (β^-)	Sb^{121}			
$_{51}Sb^{122}$							
	Fermi Formula	121.95547					
	Q-Value	121.94225±48	Sb^{122} (β^-)	Te^{122}	Te^{122}	= 121.94017±49	H. E. Duckworth NYO-981 4-18-52
$_{51}Sb^{123}$							
	Fermi Formula	122.95573					
	Q-Value	122.94124±53	Sb^{123} (γ, n)	Sb^{122}	Sb^{121}	= 120.94040±44	H. E. Duckworth NYO-981 4-18-52
			Sb^{121} (d, p)	Sb^{122}	Sb^{122}	= 121.94225±48	
$_{52}Te^{120}$							
	Fermi Formula	119.95228					
	Mass Spectra	119.94288±16	C_9H_{12} -	Te^{120}	H C	= 1.008146 = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{52}Te^{122}$					
	Fermi Formula	121.95280			
	Q-Value	121.94017±49	Sb^{122} (β^-) Te^{122}	Sb^{122} = 121.94225±48	H. E. Duckworth NYO-981 4-18-52
	Mass Spectra	121.9400 ± 6	1/2 Te^{122} - Ni^{61}	Ni^{61} = 60.94910±10 C = 12.003842±4	B. G. Hogg and H. E. Duckworth Can. J. Phys. 30, 628 (1952)
	Adjusted to	121.9395 ± 4	to agree with ratio $\frac{Te^{124} - Te^{122}}{Te^{128} - Te^{124}}$	= 0.49956±12	
	Mass Spectra	121.94193± 8	C_5H - Te^{122}	H = 1.008146±3 C = 12.003842±4	R. E. Halsted Phys. Rev. 88, 666 (1952)
$_{52}Te^{123}$					
	Fermi Formula	122.95441			
	Q-Value	122.9426 ±10	Te^{123} (γ, n) Te^{122}	Te^{122} = 121.9395 ±4	B. G. Hogg and H. E. Duckworth Can. J. Phys. 30, 628 (1952)
	Mass Spectra	122.94368±39	1/2 Te^{123} - C_5H	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{52}Te^{124}$					
	Fermi Formula	123.95432			
	Mass Spectra	123.9396 ±4	$1/2\ Te^{124} - Ni^{62}$	$Ni^{62} = 61.9468 \pm 9$	B. G. Hogg and H. E. Duckworth Can. J. Phys. 30, 628 (1952)
	Adjusted to	123.9397 ±4	to agree with ratios	$\frac{Te^{130} - Te^{128}}{Te^{128} - Te^{124}} = 0.50019 \pm 12$	
				$\frac{Te^{124} - Te^{122}}{Te^{128} - Te^{124}} = 0.49956 \pm 12$	
	Mass Spectra	123.94278±11	$C_5H_2 - 1/2\ Te^{124}$	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
$_{52}Te^{125}$					
	Fermi Formula	124.95641			
	Q-Value	124.9431 ± 4	$Te^{125}\ (\gamma, n)\ Te^{124}$	$Te^{124} = 123.9397 \pm 4$	B. G. Hogg and H. E. Duckworth Can. J. Phys. 30, 628 (1952)
	Mass Spectra	124.94460 ±31	$1/2\ Te^{125} - C_5H_2$	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666, (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{52}Te^{126}$					
	Fermi Formula	125.95681			
	Mass Spectra	125.9426 ±10	Cu^{63} - Te^{126}	Cu^{63} = 62.94854±16	H. E. Duckworth NYO-981 4-18-52
		125.94420 ± 7	C_5H_3 -1/2 Te^{126}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
	Method not given	125.9424 ± 4			B. G. Hogg and H. E. Duckworth Can. J. Phys. 30, 628 (1952)
$_{52}Te^{128}$					
	Fermi Formula	127.96021			
	Mass Spectra	127.94649±13	$C_{10}H_8$ - Te^{128}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
		127.9469 ±10	Zn^{64} - Te^{128}	Zn^{64} = 63.9844 ±16	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{52}Te^{128}$					
	Mass Spectra	127.9438± 6	Ni^{64} - 1/2 Te^{128}	Ni^{64} = 63.94751 ± 7	B. G. Hogg and H. E. Duckworth
	Adjusted to	127.9443± 4	to agree with ratios	$\frac{Te^{130} - Te^{128}}{Te^{128} - Te^{124}} = 0.50019 \pm 12$	Can. J. Phys. 30, 628
				$\frac{Te^{124} - Te^{122}}{Te^{128} - Te^{124}} = 0.49956 \pm 12$	(1952)
$_{52}Te^{130}$					
	Fermi Formula	129.96449			
	Mass Spectra	129.9468 ± 9	Cu^{65} - 1/2 Te^{130} Te^{130} - Pt^{195}	Cu^{65} = 64.94750 ±18 Pt^{195} = 195.02663 ±60	H. E. Duckworth NYO-981 4-18-52
		129.9482± 4	Cu^{65} - 1/2 Te^{130}	Cu^{65} = 64.94835 ± 6	B. G. Hogg and H. E. Duckworth
	Adjusted to	129.9479± 4	to agree with ratio	$\frac{Te^{130} - Te^{128}}{Te^{128} - Te^{124}} = 0.50019 \pm 12$	Can. J. Phys. 30, 628 (1952)
		129.94853±10	C_5H_5 - 1/2 Te^{130}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{53}I^{126}$					
	Fermi Formula	125.95721			
	Q-Value	125.94625±21*	I^{127} - I^{126} Δm $I^{127}(\gamma, n)$ I^{126}	Δm = 0.99903±21 I^{127} =126.94528±13	H. E. Duckworth NYO-981 4-18-52
$_{53}I^{127}$					
	Fermi Formula	126.95726			
	Mass Spectra	126.94528±13	$C_{10}H_7$ - I^{127}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
	Time-of-Flight	126.946 ± 1	CF_3 and C_3F_5 standards	C = 12.003895 F^{19} = 19.00445	E. E. Hays et al Phys. Rev. 85, 1065 (1952)
$_{54}Xe^{124}$					
	Fermi Formula	123.95526			
	Mass Spectra	123.94578± 7	C_5H_2 -1/2 Xe^{124}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{54}Xe^{126}$					
	Fermi Formula	125.95536			
	Mass Spectra	125.94476±14	C_5H_3 - 1/2 Xe^{126}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
$_{54}Xe^{128}$					
	Fermi Formula	127.95644			
	Mass Spectra	127.94446± 9	$C_{10}H_8$ - Xe^{128}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
$_{54}Xe^{129}$					
	Fermi Formula	128.95828			
	Mass Spectra	128.94536±26	$C_2OH_3^+ - C_3H_7^+ - 1/3\ Xe^{129+++}$	H = 1.008144± 8 C = 12.003798±25	C. L. Kegley and H. E. Duckworth Nature 167, 1025 (1951); H. E. Duckworth NYO-981 4-18-53
		128.94601±15	C_3H_7 - 1/3 Xe^{129}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{54}Xe^{129}$	Time-of-Flight	128.9455 ±15	C_8H_9 and C_9H_{12} standards	H = 1.0081386 C = 12.003895	E. E. Hays et al Phys. Rev. 84, 824 (1951)
	Weighted Mean - Mass Spectra Values	128.94594 ±15		H = 1.008146 C = 12.003842	B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
$_{54}Xe^{130}$	Fermi Formula	129.95846			
	Mass Spectra	129.94501±10	C_5H_5 - 1/2 Xe^{130}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
	Time-of-Flight	129.945 ± 2	C_9H_2 and Xe^{129} standards	H = 1.0081386 C = 12.003895 Xe = 128.9455 ±15	E. E. Hays et al Phys. Rev. 84, 824 (1951)

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{54}Xe^{131}$					
	Fermi Formula	130.96075			
	Mass Spectra	130.94673±42	CO_2 - 1/2 Xe^{131}	C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
	Time-of-Flight	130.944 ± 2	C_9H_{12} and Xe^{129} standards	H = 1.0081386 C = 12.003895 Xe = 128.9455 ±15	E. E. Hays et al Phys. Rev. 84, 824 (1951)
$_{54}Xe^{132}$					
	Fermi Formula	131.96139			
	Mass Spectra	131.94615±10	C_5H_6 - Xe^{132} CO_2 - 1/3 Xe^{132}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
		131.94727±60	CO_2^+ - $C_2OH_4^+$ - Xe^{132+++}	H = 1.008144± 8 C = 12.003798±25	C. L. Kegley and and H. E. Duckworth Nature 167, 1025 (1951); H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction and Doublet	Reference Masses	References
$_{54}Xe^{132}$	Time-of-Flight	131.945 ± 2	C_9H_{12} and Xe^{129} standards	H = 1.0081386 C = 12.003895 Xe^{129} = 128.9455 ±15	E. E. Hays et al Phys. Rev. 84, 824 (1951)
$_{54}Xe^{134}$	Fermi Formula	133.96517			
	Mass Spectra	133.94803±12	C_5H_7 - 1/2 Xe^{134}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)
	Time-of-Flight	133.947 ±2	C_9H_{12} and Xe^{129} standards	H = 1.0081386 C = 12.003895 Xe^{129} = 128.9455 ±15	E. E. Hays et al Phys. Rev. 84, 824 (1951)
$_{54}Xe^{136}$	Fermi Formula	135.96978			
	Mass Spectra	135.95046 ±11	C_5H_8 - 1/2 Xe^{136}	H = 1.008146 C = 12.003842	R. E. Halsted Phys. Rev. 88, 666 (1952)

	Method	Mass	Reaction and Doublet	Reference Masses	References
$_{55}Cs^{132}$					
	Fermi Formula	131.96139			
	Q-Value	$\Delta m = 0.99926 \pm 21$	Cs^{133} (γ, n) Cs^{132}		H. E. Duckworth NYO-981 4-18-52
$_{55}Cs^{133}$					
	Fermi Formula	132.96170			
	Q-Value	$\Delta m = 0.99926 \pm 21$	Cs^{133} (γ, n) Cs^{132}		H. E. Duckworth NYO-981 4-18-52
$_{56}Ba^{136}$					
	Fermi Formula	135.96325			
	Q-Value	135.9488 ±10	Ba^{138} (γ, n) Ba^{137} Ba^{137} (γ, n) Ba^{136}	$Ba^{137} = 136.9502 \pm 10$ $Ba^{138} = 137.9498 \pm 9$	H. E. Duckworth et al Phys. Rev. 83, 1114 (1951); NYO-680 5-30-51
$_{56}Ba^{137}$					
	Fermi Formula	136.96570			
	Q-Value	136.9502 ±10	Ba^{138} (γ, n) Ba^{137}	$Ba^{138} = 137.9498 \pm 9$	H. E. Duckworth et al Phys. Rev. 83, 1114 (1951); NYO-680 5-30-51

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{56}Ba^{138}$					
	Fermi Formula	137.96657			
	Mass Spectra	137.95099 ±83	Zr^{92} - Ba^{138}	Zr^{92} = 91.93393±34	H. E. Duckworth NYO-981 4-18-52
$_{56}Ba^{139}$					
	Fermi Formula	138.96942			
	Q-Value	138.95436±87	$Ba^{139}(\beta^-)La^{139}$	La^{139} = 138.95182±83	H. E. Duckworth NYO-981 4-18-52
$_{56}Ba^{140}$					
	Fermi Formula	139.97069			
	Q-Value	139.9548 ±14	$Ba^{140}(\beta^-)La^{140}$	La^{140} = 139.9537 ±14	H. E. Duckworth NYO-981 4-18-52
$_{57}La^{138}$					
	Fermi Formula	137.96622			
	Q-Value	137.95239 ±86	$La^{139}(\gamma, n)La^{138}$	La^{139} = 138.95182 ±83	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{57}La^{139}$					
	Fermi Formula	138.96676			
	Q-Value	138.95182 ±83	$Ba^{138}(d, p)Ba^{139}$ $Ba^{139}(\beta^-)La^{139}$	Ba^{138} = 137.95099±83	H. E. Duckworth NYO-981 4-18-52
$_{57}La^{140}$					
	Fermi Formula	139.96929			
	Q-Value	139.9537 ±14	$La^{140}(\beta^-)Ce^{140}$ $Ba^{140}(\beta^-)La^{140}$	Ce^{140} = 139.9496 ±14 Ba^{140} = 139.9548 ±14	H. E. Duckworth NYO-981 4-18-52
$_{57}La^{141}$					
	Fermi Formula	140.97025			
	Q-Value	140.9557 ±14	$La^{141}(\beta^-)Ce^{141}$	Ce^{141} = 140.9527 ±14	H. E. Duckworth NYO-981 4-18-52
$_{58}Ce^{139}$					
	Fermi Formula	138.96554			
	Q-Value	138.9503 ±15	$Ce^{140}(\gamma, n)Ce^{139}$	Ce^{140} = 139.9496 ±14	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet		Reference Masses	References
$_{58}Ce^{140}$						
	Fermi Formula	139.96578				
	Q-Value	139.9496 ±14	$Pr^{141}(\gamma, n)$	Pr^{140}	Pr^{141} = 140.9521 ±14	H. E. Duckworth NYO-981 4-18-53
			$Pr^{140}(EC, \beta^+)$	Ce^{140}		
$_{58}Ce^{141}$						
	Fermi Formula	140.96799				
	Q-Value	140.9527 ±14	$Ce^{142}(\gamma, n)$	Ce^{141}	Ce^{142} = 141.9540 ±14	H. E. Duckworth NYO-981 4-18-52
$_{58}Ce^{142}$						
	Fermi Formula	141.96865				
	Q-Value	141.9540 ±14	$Ce^{142}(\gamma, n)$	Ce^{141}	Pr^{141} = 140.9521 ±14	H. E. Duckworth NYO-981 4-18-52
			$Ce^{141}(\beta^-)$	Pr^{141}		
$_{58}Ce^{144}$						
	Fermi Formula	143.97232				
	Q-Value	143.9602 ± 8	$Ce^{144}(\beta^-)$	Pr^{144}	Nd^{144} = 143.9560 ± 8	H. E. Duckworth NYO-981 4-18-52
			$Pr^{144}(\beta^-)$	Nd^{144}		

Method	Mass	Reaction or Doublet	Reference Masses	References
$_{59}Pr^{140}$				
Fermi Formula	139.96723			
Q-Value	139.9533 ±14	$Pr^{140}(EC, \beta^+)\ Ce^{140}$	Ce^{140} = 139.9496 ±14	H. E. Duckworth NYO-981 4-18-52
$_{59}Pr^{141}$				
Fermi Formula	140.96715			
Mass Spectra	140.9521 ±14	Pr^{141} - Ti^{47}	Ti^{47} = 46.96694 ±47	H. E. Duckworth NYO-981 4-18-52
$_{59}Pr^{144}$				
Fermi Formula	143.97167			
Q-Value	143.9594 ± 8	$Pr^{144}(\beta^-)\ Nd^{144}$	Nd^{144} = 143.9560 ± 8	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{60}Nd^{143}$					
	Fermi Formula	142.96891			
	Q-Value	$\Delta m = 4.00628$	$Sm^{147}(\alpha)Nd^{143}$		H. E. Duckworth NYO-981 4-18-52
$_{60}Nd^{144}$					
	Fermi Formula	143.96895			
	Mass Spectra	143.9560 ± 8	Ge^{72} - Nd^{144} Mo^{96} - Nd^{144}	Ge^{72} = 71.9430 ± 6 Mo^{96} = 95.93559 ± 38	H. E. Duckworth et al Phys. Rev. 83, 114 (1951); NYO-680; 5-30-51 H. E. Duckworth, NYO-981, 4-18-52
$_{60}Nd^{149}$					
	Fermi Formula	148.97737			
	Q-Value	148.9678 ± 8	$Nd^{150}(\gamma, n)Nd^{149}$	Nd^{150} = 149.9687 ± 8	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{60}Nd^{150}$					
	Fermi Formula	149.97861			
	Mass Spectra	149.9687 ± 8	Nd^{150} - Mo^{100}	Mo^{100} = 99.93830±40	H. E. Duckworth et al Phys. Rev. 83, 1114 (1951); NYO-680 5-30-51 H. E. Duckworth NYO-981 4-18-52
$_{61}Pm^{147}$					
	Fermi Formula	146.97265			
	Q-Value	Δm = 0.00242	$Pm^{147}(\beta^-)$ Sm^{147}		H. E. Duckworth NYO-981 4-18-52
$_{62}Sm^{147}$					
	Fermi Formula	146.97290			
	Q-Value	Δm = 0.00242	$Pm^{147}(\beta^-)$ Sm^{147}		H. E. Duckworth NYO-981, 4-18-52
		Δm = 4.00628	$Sm^{147}(\alpha)$ Nd^{143}		H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{62}Sm^{152}$					
	Fermi Formula	151.97761			
	Mass Spectra	151.9623 ±24	Se^{76} - Sm^{152}	Se^{76} = 75.9410 ±12	H. E. Duckworth NYO-981 4-18-52
$_{62}Sm^{154}$					
	Fermi Formula	153.98116			
	Mass Spectra	153.9660 ±24	Se^{77} - Sm^{154}	Se^{77} = 76.9421 ±12	H. E. Duckworth NYO-981 4-18-52
$_{71}Lu^{176}$					
	Fermi Formula	176.00784			
	Q-Value	175.9925 ±10	Lu^{176} (β^-) Hf^{176}	Hf^{176} = 175.9922 ±10	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{72}Hf^{176}$					
	Fermi Formula	176.00598			
	Mass Spectra	175.9922 ±10	Sr^{88} - Hf^{176}	Sr^{88} = 87.93356±35	H. E. Duckworth et al Phys. Rev. 83, 1114 (1951) (NYO-680); 5-30-51 H. E. Duckworth NYO-981 4-18-52
$_{72}Hf^{178}$					
	Fermi Formula	178.00894			
	Mass Spectra	177.9936 ±13	Y^{89} - Hf^{178}	Y^{89} = 88.93390±44	H. E. Duckworth et al Phys. Rev. 83, 1114 (1951); (NYO-680); 5-30-51 H. E. Duckworth NYO-981 4-18-52
$_{72}Hf^{180}$					
	Fermi Formula	180.01253			
	Mass Spectra	180.00306 ±90	Ni^{60} - Hf^{180} Zr^{90} - Hf^{180}	Ni^{60} = 59.94923±15 Zr^{90} = 89.93303±30	H. E. Duckworth NYO-981, 4-18-52
	Adjusted Value	180.0026 ± 9		To correspond with best Ta^{180} value.	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{73}Ta^{180}$					
	Fermi Formula	180.01315			
	Q-Value	180.0032 ±12	$Ta^{181}(\gamma, n)$ Ta^{180}	Ta^{181} = 181.0047 ±12	To agree with known Hf^{180} - Ta^{180} Δm. H. E. Duckworth NYO-981 4-18-52
	Adjusted Value	180.0039 ±12			
$_{73}Ta^{181}$					
	Fermi Formula	181.01404			
	Q-Value	181.0040 ±12	$Ta^{181}(d, p)$ Ta^{182} $Ta^{182}(\beta^-)$ W^{182}	W^{182} = 182.0043 ±12	H. E. Duckworth NYO-981 4-18-52
	Adjusted Value	181.0047 ±12			To correspond with Hf^{180} - Ta^{180} Δm.
$_{73}Ta^{182}$					
	Fermi Formula	182.01654			
	Q-Value	182.0072 ±12	$Ta^{182}(\beta^-)$ W^{182}	W^{182} = 182.0043 ±12	Adjusted to agree with the Ta^{180} - W^{180} Δm. H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{74}W^{180}$					
	Fermi Formula	180.01198			
	Q-Value	180.0031 ±12	Ta^{180} (β^-) W^{180}	Ta^{180} = 180.0039 ±12	H. E. Duckworth NYO-981 4-18-52
$_{74}W^{182}$					
	Fermi Formula	182.01458			
	Mass Spectra	182.0043 ±12	Zr^{91} - W^{182}	Zr^{91} = 90.93432±31	H. E. Duckworth NYO-981 4-18-52
	Adjusted Value	182.0050 ±12			To correspond with Ta^{180} - W^{180} Δm
$_{74}W^{183}$					
	Fermi Formula	183.01684			
	Mass Spectra	183.00000 ±11	Ni^{61} - W^{183}	Ni^{61} = 60.94820±30	H. E. Duckworth and R. S. Preston NYO-678; 11-20-50
	Q-Value	183.0073 ±12	W^{183} (γ, n) W^{182}	W^{182} = 182.0050 ±12	H. E. Duckworth NYO-981, 4-18-52 States Ni^{61} - W^{183} Δf "not too good!"

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{74}W^{184}$					
	Fermi Formula	184.01781			
	Mass Spectra	184.0064 ±12	Zr^{92} - W^{184}	Zr^{92} = 91.93393±34	H, E. Duckworth NYO-981 4-18-52
		184.0074 ± 4	Zr^{92} - 1/2 W^{184} Mo^{92} - 1/2 W^{184}	Zr^{92} = 91.9339 ± 4 Mo^{92} = 91.9352 ± 4	J. S. Geiger et al Phys. Rev. 89, 621 (1953); B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
$_{74}W^{186}$					
	Fermi Formula	186.02164			
	Mass Spectra	186.00941 ±78	Ni^{62} - W^{186}	Ni^{62} = 61.94715±20	H. E. Duckworth NYO-981 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{76}Os^{188}$	Fermi Formula	188.02372			
	Mass Spectra	188.0157 ± 5	Zr^{94} - 1/2 Os^{188}	Zr^{94} = 93.9365± 5	J. S. Geiger et al Phys. Rev. 89, 621 (1953); B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953).
			Mo^{94} - 1/2 Os^{188}	Mo^{94} = 93.9353± 4	
$_{76}Os^{192}$	Fermi Formula	192.03123			
	Mass Spectra	192.0224 ± 5	Zr^{96} - 1/2 Os^{192}	Zr^{96} = 95.9394± 5	J. S. Geiger et al Phys. Rev. 89, 621 (1953); B. G. Hogg and H. E. Duckworth Can. J. Phys. 31, 942 (1953)
			Mo^{96} - 1/2 Os^{192}	Mo^{96} = 95.9358± 4	
			Ru^{96} - 1/2 Os^{192}	Ru^{96} = 95.9388± 4	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{78}Pt^{192}$					
	Fermi Formula	192.03023			
	Mass Spectra	192.0280 ±15	Zn^{64} - Pt^{192}	Zn^{64} = 63.95021±41	H. E. Duckworth and R. S. Preston NYO-678, 11-20-50
					In NYO-981 4-18-52 Duckworth states that this Zn^{64} - Pt^{192} packing fraction data is unreliable.
$_{78}Pt^{193}$					
	Fermi Formula	193.03242			
	Q-Value	193.02544±82	Pt^{194} (γ, n) Pt^{193}	Pt^{194} = 194.02422±80	H. E. Duckworth NYO-981 4-18-52
$_{78}Pt^{194}$					
	Fermi Formula	194.03336			
	Mass Spectra	194.02526 ±105	Mo^{97} - Pt^{194}	Mo^{97} = 96.93716±45	H. E. Duckworth NYO-981, 4-18-52
	Adjusted Value	194.02422± 80	Pt^{194} (d, p) Pt^{195} Pt^{195} (γ, n) Pt^{194}	To agree with Pt^{194} - Pt^{195} Δm.	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{78}Pt^{195}$					
	Fermi Formula	195.03582			
	Mass Spectra	195.02588±78	C_3H_3 - Pt^{195}	H = 1.008142 ± 3 C = 12.003804 ± 17	H. E. Duckworth NYO-981, 4-18-52
	Adjusted Value	195.02663±60	$Pt^{194}(d,p)Pt^{195}$ $Pt^{195}(\gamma,n)Pt^{194}$		To agree with Pt^{194} - Pt^{195} Δm.
$_{78}Pt^{196}$					
	Fermi Formula	196.03705			
	Q-Value	196.02691±62	$Pt^{195}(d,p)Pt^{196}$ $Pt^{195}(\gamma,n)Pt^{194}$	Pt^{195} = 195.02663 ± 60	H. E. Duckworth NYO-981, 4-18-52
$_{78}Pt^{198}$					
	Fermi Formula	198.04130			
	Mass Spectra	198.0287 ±13	Pt^{198} - Zn^{66}	Zn^{66} = 65.94591 ±27 Cu^{65} = 64.94750 ±18 Pt^{195} = 195.02663 ±60	H. E. Duckworth NYO-981 4-18-52
				This packing fraction difference found to be 0.20 ± 0.03 greater than that for Pt^{195} - Cu^{65}	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{79}Au^{196}$					
	Fermi Formula	196.03805			
	Q-Value	Δm = 1.00038	Au^{197} (γ, n) Au^{196}		H. E. Duckworth NYO-981, 4-18-52
		Δm = 0.00051	Au^{196} (β^-) Hg^{196}		
$_{79}Au^{197}$					
	Fermi Formula	197.03905			
	Q-Value	Δm=1.00038	Au^{197} (γ, n) Au^{196}		H. E. Duckworth NYO-981, 4-18-52
		Δm=1.00216±16	Au^{198} (d, p) Au^{197}		
$_{79}Au^{198}$					
	Fermi Formula	198.04156			
	Q-Value	Δm=1.00216±16	Au^{198} (d, p) Au^{197}		H. E. Duckworth NYO-981, 4-18-52
		Δm=0.00147	Au^{198} (β^-) Hg^{198}		
$_{79}Au^{199}$					
	Fermi Formula	199.04284			
	Q-Value	Δm=0.00059	Au^{199} (β^-) Hg^{199}		H. E. Duckworth NYO-981, 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{80}Hg^{196}$					
	Fermi Formula	196.03736			
	Q-Value	$\Delta m = 0.00051$	Au^{196} (β^-) Hg^{196}		H. E. Duckworth NYO-981, 4-18-52
$_{80}Hg^{198}$					
	Fermi Formula	198.04014			
	Q-Value	$\Delta m = 0.00147$	Au^{198} (β^-) Hg^{198}		H. E. Duckworth NYO-981, 4-18-52
$_{80}Hg^{199}$					
	Fermi Formula	199.04242			
	Q-Value	$\Delta m = 0.00059$	Au^{199} (β^-) Hg^{199}		H. E. Duckworth NYO-981, 4-18-52
$_{80}Hg^{200}$					
	Fermi Formula	200.04349			
	Q-Value	$\Delta m = 1.00227 \pm 21$	Hg^{201} (γ, n) Hg^{200}		H. E. Duckworth NYO-981, 4-18-52
$_{80}Hg^{201}$					
	Fermi Formula	201.04605			
	Q-Value	$\Delta m = 1.00227$	Hg^{201} (γ, n) Hg^{200}		H. E. Duckworth NYO-981, 4-18-52

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{80}Hg^{203}$					
	Fermi Formula	203.05022			
	Q-Value	*203.0404±10	Hg^{203} (β^-) Tl^{203}	Tl^{203} = 203.0352±10 Δm = 0.00523	H. E. Duckworth NYO-981, 4-18-52
$_{81}Tl^{202}$					
	Fermi Formula	202.04828			
	Q-Value	202.0357±10	$Tl^{203}(\gamma, n)$ Tl^{202}	Tl^{203} = 203.0352±10	H. E. Duckworth NYO-981, 4-18-52
	Accumulative Decay Energy	202.03497	(Value uncertain)	Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{81}Tl^{203}$					
	Fermi Formula	203.04941			
	Q-Value	203.0352±10	$Tl^{205}(\gamma, n)$ Tl^{204} $Tl^{203}(d, p)$ Tl^{204} $Tl^{204}(\beta^-)$ Pb^{204}	Pb^{204} = 204.0363±10	H. E. Duckworth NYO-981, 4-18-52
	Accumulative Decay Energy	203.03450		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{81}Tl^{203}$				Neutron Binding Energies:	
				$Pb^{206-207}$ = 6.73 Mev	
				$Pb^{207-208}$ = 7.38 Mev	
				$Pb^{208-209}$ = 3.87 Mev	
$_{81}Tl^{204}$					
	Fermi Formula	204.05201			
	Q-Value	204.0372±10	Tl^{204} (β^-) Pb^{204}	Pb^{204} = 204.0363±10	H. E. Duckworth NYO-981, 4-18-52
	Accumulative Decay Energy	204.03658		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies:	
				$Pb^{206-207}$ = 6.73 Mev	
				$Pb^{207-208}$ = 7.38 Mev	
				$Pb^{208-209}$ = 3.87 Mev	

Method	Mass	Reaction or Doublet	Reference Masses	References
$_{81}Tl^{205}$				
Fermi Formula	205.05341			
Q-Value	205.0380±10	Tl^{205} (d, p) Tl^{206} Tl^{206} (β^-) Pb^{206}	Pb^{206} = 206.0388±10	H. E. Duckworth NYO-981, 4-18-53
Accumulative Decay Energy	205.03753		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
		Neutron Binding Energies:		
		$Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev		
$_{81}Tl^{206}$				
Fermi Formula	206.05626			
Q-Value	206.0404±10	Tl^{206} (β^-) Pb^{206}	Pb^{206} = 206.0388±10	H. E. Duckworth NYO-981, 4-18-53
Accumulative Decay Energy	206.03982		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{81}Tl^{206}$				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{81}Tl^{207}$	Fermi Formula	207.05793			
	Accumulative Decay Energy	207.04149		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{81}Tl^{208}$	Fermi Formula	208.06104			
	Accumulative Decay Energy	208.04636		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{81}Tl^{209}$					
	Fermi Formula	209.06296			
	Accumulative Decay Energy	209.05003		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{81}Tl^{210}$					
	Fermi Formula	210.06631			
	Accumulative Decay Energy	210.05497		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{82}Pb^{204}$					
	Fermi Formula	204.05054			
	Q-Value	204.0363±10	$Tl^{205}(\gamma, n)Tl^{204}$ $Tl^{204}(\beta^-)Pb^{204}$	Tl^{205} = 205.0380±10	H. E. Duckworth NYO-981, 4-18-52
	Accumulative Decay Energy	204.03576		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{82}Pb^{206}$					
	Fermi Formula	206.05411			
	Q-Value	206.0388±10	$Pb^{206}(n, \gamma)Pb^{207}$ $Pb^{206}(d, p)Pb^{207}$ $Pb^{207}(\gamma, n)Pb^{206}$	Pb^{207} = 207.0405±10	H. E. Duckworth NYO-981, 4-18-52
	Accumulative Decay Energy	206.03820		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{82}Pb^{207}$					
	Fermi Formula	207.05675			
	Mass Spectra	207.0429±16	$Ba^{138} - Pb^{207}$	Ba^{138} = 137.95099±83	H. E. Duckworth NYO-981, 4-18-52
	Adjusted Value	207.0405±10	from $Pb^{207} - Pb^{208}$ Δm Pb^{207} (n, γ) Pb^{208} Pb^{207} (d, p) Pb^{208} Pb^{208} (γ, n) Pb^{207}		
	Accumulative Decay Energy	207.03995		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{82}Pb^{208}$					
	Fermi Formula	208.05820			
	Q-Value	208.0440±16	Pb^{207} (n, γ) Pb^{208} Pb^{208} (γ, n) Pb^{207} Pb^{207} (d, p) Pb^{208}	Pb^{207} = 207.0429±16	H. E. Duckworth NYO-981, 4-18-52
	Mass Spectra	208.0409±13	$Pd^{104} - Pb^{208}$	Pd^{104} = 103.93667±64	
	Adjusted Value from Duckworth	208.0421±12			

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{82}Pb^{208}$	Time-of-Flight	208.0416±15	$C_3F_5^+$, $C_4F_7^+$ and $C_5F_9^+$ standards	C = 12.003895 F = 19.00445	P. I. Richards et al Phys. Rev. 85, 630 (1952); BNL-1025, 11-8-51
$_{82}Pb^{209}$	Fermi Formula	209.06110			
	Accumulative Decay Energy	209.04582		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{82}Pb^{210}$	Fermi Formula	210.06281			
	Accumulative Decay Energy	210.04919		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{82}Pb^{211}$					
	Fermi Formula	211.06596			
	Accumulative Decay Energy	211.05410		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{82}Pb^{212}$					
	Fermi Formula	212.06793			
	Accumulative Decay Energy	212.05750		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{82}Pb^{214}$					
	Fermi Formula	214.07352			
	Accumulative Decay Energy	214.06596		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{83}Bi^{206}$					
	Fermi Formula	206.05562			
	Accumulative Decay Energy	206.04337	(Value uncertain)	Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{83}Bi^{207}$					
	Fermi Formula	207.05659			
	Accumulative Decay Energy	207.04263		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{83}Bi^{208}$					
	Fermi Formula	208.05901			
	Accumulative Decay Energy	208.04415		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{83}Bi^{209}$					
	Fermi Formula	209.06025			
	Q-Value	209.0457±10	Pb^{208} (d, p) Pb^{209} Pb^{209} (β^-) Bi^{209}	Pb^{208} = 208.0421±12	H. E. Duckworth NYO-981, 4-18-52
	Time-of-Flight	209.0466±15	$C_3F_5^+$, $C_4F_7^+$ and $C_5F_9^+$ as standards	C^{12} = 12.003895 F^{19} = 19.00445	P. I. Richards, et al Phys. Rev. 85, 630 (1952)
	Accumulative Decay Energy	209.04514		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{83}Bi^{210}$					
	Fermi Formula	210.06293			
	Accumulative Decay Energy	210.04912		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{83}Bi^{211}$					
	Fermi Formula	211.06443			
	Accumulative Decay Energy	211.05261		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{83}Bi^{212}$					
	Fermi Formula	212.06736			
	Accumulative Decay Energy	212.05689		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{83}Bi^{213}$					
	Fermi Formula	213.06912			
	Accumulative Decay Energy	213.06031		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{83}Bi^{214}$					
	Fermi Formula	214.07229			
	Accumulative Decay Energy	214.06487		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

Method	Mass	Reaction or Doublet	Reference Masses	References
$_{83}Bi^{215}$				
Fermi Formula	215.07430			
Accumulative Decay Energy	215.06820		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{84}Po^{208}$				
Fermi Formula	208.05820			
Accumulative Decay Energy	208.04522		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{84}Po^{209}$	Fermi Formula	209.06040			
	Accumulative Decay Energy	209.04721		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{84}Po^{210}$	Fermi Formula	210.06143			
	Accumulative Decay Energy	210.04786		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

Method	Mass	Reaction or Doublet	Reference Masses	References
$_{84}Po^{211}$				
Fermi Formula	211.06390			
Accumulative Decay Energy	211.05196		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{84}Po^{212}$				
Fermi Formula	212.06520			
Accumulative Decay Energy	212.05447		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{84}Po^{213}$					
	Fermi Formula	213.06792			
	Accumulative Decay Energy	213.05882		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{84}Po^{214}$					
	Fermi Formula	214.06947			
	Accumulative Decay Energy	214.06146		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

Method	Mass	Reaction or Doublet	Reference Masses	References
$_{84}Po^{215}$				
Fermi Formula	215.07244			
Accumulative Decay Energy	215.06604		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
			Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{84}Po^{216}$				
Fermi Formula	216.07424			
Accumulative Decay Energy	216.06878		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
			Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

Method	Mass	Reaction or Doublet	Reference Masses	References
$_{84}Po^{217}$				
Fermi Formula	217.07745			
Accumulative Decay Energy	217.07327		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
			Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{84}Po^{218}$				
Fermi Formula	218.07950			
Accumulative Decay Energy	218.07639		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
			Neutron Binding Energies; $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{85}At^{210}$					
	Fermi Formula	210.06355			
	Accumulative Decay Energy	210.05329	(Value uncertain)	Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{85}At^{211}$					
	Fermi Formula	211.06437			
	Accumulative Decay Energy	211.05292		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{85}At^{212}$					
	Fermi Formula	212.06662			
	Accumulative Decay Energy	212.05618	(Value uncertain)	Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{85}At^{213}$					
	Fermi Formula	213.06770			
	Accumulative Decay Energy	213.05889		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

Method	Mass	Reaction or Doublet	Reference Masses	References
$_{85}At^{214}$				
Fermi Formula	214.07021			
Accumulative Decay Energy	214.06260		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
			Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{85}At^{215}$				
Fermi Formula	215.07156			
Accumulative Decay Energy	215.06523		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
			Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{85}At^{216}$					
	Fermi Formula	216.07431			
	Accumulative Decay Energy	216.06928		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{85}At^{217}$					
	Fermi Formula	217.07591			
	Accumulative Decay Energy	217.07186		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{85}At^{218}$					
	Fermi Formula	218.07890			
	Accumulative Decay Energy	218.07599		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{85}At^{219}$					
	Fermi Formula	219.08075			
	Accumulative Decay Energy	219.07893		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{86}Em^{212}$					
	Fermi Formula	212.06644			
	Accumulative Decay Energy	212.05594		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{86}Em^{215}$					
	Fermi Formula	215.07166			
	Accumulative Decay Energy	215.06523		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{86}Em^{216}$					
	Fermi Formula	216.07280			
	Accumulative Decay Energy	216.06710		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{86}Em^{217}$					
	Fermi Formula	217.07535			
	Accumulative Decay Energy	217.07116		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{86}Em^{218}$					
	Fermi Formula	218.07675			
	Accumulative Decay Energy	218.07312		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{86}Em^{219}$					
	Fermi Formula	219.07954			
	Accumulative Decay Energy	219.07737		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{86}Em^{220}$					
	Fermi Formula	220.08119			
	Accumulative Decay Energy	220.07951		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{86}Em^{221}$					
	Fermi Formula	221.08422			
	Accumulative Decay Energy	221.08358		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{86}Em^{222}$					
	Fermi Formula	222.08611			
	Accumulative Decay Energy	222.08626		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{87}Fr^{217}$					
	Fermi Formula	217.07576			
	Accumulative Decay Energy	217.07184		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{87}Fr^{218}$	Fermi Formula	218.07809			
	Accumulative Decay Energy	218.07506		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{87}Fr^{219}$	Fermi Formula	219.07929			
	Accumulative Decay Energy	219.07709		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{87}Fr^{220}$	Fermi Formula	220.08187			
	Accumulative Decay Energy	220.08047		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{87}Fr^{221}$	Fermi Formula	221.08332			
	Accumulative Decay Energy	221.08263		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{87}Fr^{222}$					
	Fermi Formula	222.08614			
	Accumulative Decay Energy	222.08630		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{87}Fr^{223}$					
	Fermi Formula	223.08783			
	Accumulative Decay Energy	223.08881		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{88}Ra^{219}$					
	Fermi Formula	219.08001			
	Accumulative Decay Energy	219.07786		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{88}Ra^{220}$					
	Fermi Formula	220.08100			
	Accumulative Decay Energy	220.07910		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{88}Ra^{221}$					
	Fermi Formula	221.08338			
	Accumulative Decay Energy	221.08237		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{88}Ra^{222}$					
	Fermi Formula	222.08463			
	Accumulative Decay Energy	222.08417		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{88}Ra^{223}$	Fermi Formula	223.08725			
	Accumulative Decay Energy	223.08754		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{88}Ra^{224}$	Fermi Formula	224.08875			
	Accumulative Decay Energy	224.08959		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{88}Ra^{225}$					
	Fermi Formula	225.09161			
	Accumulative Decay Energy	225.09317		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{88}Ra^{226}$					
	Fermi Formula	226.09334			
	Accumulative Decay Energy	226.09535		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{88}Ra^{227}$					
	Fermi Formula	227.09643			
	Accumulative Decay Energy	227.09949		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{88}Ra^{228}$					
	Fermi Formula	228.09840			
	Accumulative Decay Energy	228.10177		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{88}Ra^{229}$	Fermi Formula	229.10171			
	Accumulative Decay Energy	229.10562		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{88}Ra^{230}$	Fermi Formula	230.10391			
	Accumulative Decay Energy	230.10844	(Value uncertain)	Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{89}Ac^{221}$	Fermi Formula	221.08440			
	Accumulative Decay Energy	221.08395		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{89}Ac^{222}$	Fermi Formula	222.08657			
	Accumulative Decay Energy	222.08655		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{89}Ac^{223}$	Fermi Formula	223.08762			
	Accumulative Decay Energy	223.08822		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{89}Ac^{224}$	Fermi Formula	224.09004			
	Accumulative Decay Energy	224.09108		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{89}Ac^{225}$	Fermi Formula	225.09134		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
	Accumulative Decay Energy	225.09283			
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{89}Ac^{226}$	Fermi Formula	226.09399			
	Accumulative Decay Energy	226.09602		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{89}Ac^{227}$	Fermi Formula	227.09553			
	Accumulative Decay Energy	227.09809		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

Neutron Binding Energies:

$Pb^{206-207}$ = 6.73 Mev

$Pb^{207-208}$ = 7.38 Mev

$Pb^{208-209}$ = 3.87 Mev

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{89}Ac^{228}$					
	Fermi Formula	228.09842			
	Accumulative Decay Energy	228.10173		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{89}Ac^{229}$					
	Fermi Formula	229.10019			
	Accumulative Decay Energy	229.10366		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{89}Ac^{230}$	Fermi Formula	230.10331			
	Accumulative Decay Energy	230.10722	(Value uncertain)	Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{90}Th^{223}$	Fermi Formula	223.08894			
	Accumulative Decay Energy	223.08998		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{90}Th^{224}$	Fermi Formula	224.08979			
	Accumulative Decay Energy	224.09077		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{90}Th^{225}$	Fermi Formula	225.09201			
	Accumulative Decay Energy	225.09342		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{90}Th^{226}$					
	Fermi Formula	226.09311			
	Accumulative Decay Energy	226.09498		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{90}Th^{227}$					
	Fermi Formula	227.09557			
	Accumulative Decay Energy	227.09800		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{90}Th^{228}$					
	Fermi Formula	228.09692			
	Accumulative Decay Energy	228.09939		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{90}Th^{229}$					
	Fermi Formula	229.09961			
	Accumulative Decay Energy	229.10252		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{90}Th^{230}$	Fermi Formula	230.10119			
	Accumulative Decay Energy	230.10433		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{90}Th^{231}$	Fermi Formula	231.10411			
	Accumulative Decay Energy	231.10781		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{90}Th^{232}$					
	Fermi Formula	232.10593			
	Mass Spectra	232.1093±10	Fe^{58} - Th^{232} Sn^{116} - Th^{232}	Fe^{58} = 57.95106±25 Sn^{116} = 115.93761±48	G. S. Stanford et al Phys. Rev. 85,1039(1952) H. E. Duckworth NYO-981, 4-18-52
	Accumulative Decay Energy	232.11001		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{90}Th^{233}$					
	Fermi Formula	233.10907			
	Accumulative Decay Energy	233.11356		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{90}Th^{234}$					
	Fermi Formula	234.11112			
	Accumulative Decay Energy	234.11609		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{90}Th^{235}$					
	Fermi Formula	235.11448			
	Accumulative Decay Energy	235.12009		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{91}Pa^{225}$					
	Fermi Formula	225.09363			
	Accumulative Decay Energy	225.09573		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{91}Pa^{226}$					
	Fermi Formula	226.09564			
	Accumulative Decay Energy	226.09786		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{91}Pa^{227}$	Fermi Formula	227.09654			
	Accumulative Decay Energy	227.09916		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{91}Pa^{228}$	Fermi Formula	228.09880			
	Accumulative Decay Energy	228.10161		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{91}Pa^{229}$	Fermi Formula	229.09995			
	Accumulative Decay Energy	229.10292		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{91}Pa^{230}$	Fermi Formula	230.10244			
	Accumulative Decay Energy	230.10575		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{91}Pa^{231}$					
	Fermi Formula	231.10383			
	Accumulative Decay Energy	231.10746		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{91}Pa^{232}$					
	Fermi Formula	232.10656			
	Accumulative Decay Energy	232.11049		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{91}Pa^{233}$					
	Fermi Formula	233.10818			
	Accumulative Decay Energy	233.11223		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{91}Pa^{234}$					
	Fermi Formula	234.11113			
	Accumulative Decay Energy	234.11559		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{91}Pa^{235}$					
	Fermi Formula	235.11299			
	Accumulative Decay Energy	235.11819		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{92}U^{227}$					
	Fermi Formula	227.09845			
	Accumulative Decay Energy	227.10152		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{92}U^{228}$					
	Fermi Formula	228.09916			
	Accumulative Decay Energy	228.10193		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{92}U^{229}$					
	Fermi Formula	229.10122			
	Accumulative Decay Energy	229.10431		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{92}U^{230}$	Fermi Formula	230.10218			
	Accumulative Decay Energy	230.10528		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

Neutron Binding Energies:

$Pb^{206-207}$ = 6.73 Mev
$Pb^{207-208}$ = 7.38 Mev
$Pb^{208-209}$ = 3.87 Mev

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{92}U^{231}$	Fermi Formula	231.10448			
	Accumulative Decay Energy	231.10783		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{92}U^{232}$	Fermi Formula	232.10568			
	Accumulative Decay Energy	232.10907		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208=209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{92}U^{233}$					
	Fermi Formula	233.10821			
	Accumulative Decay Energy	233.11167		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{92}U^{234}$					
	Fermi Formula	234.10965			
	Mass Spectra	234.1133±11	Sn^{117} - U^{234}	Sn^{117} = 116.93957±45	G. S. Stanford et al Phys. Rev. 85, 1039 (1952); H. E. Duckworth NYO-981, 4-18-52
		234.1129±10	Adjusted value in Phys. Rev. 85, 1039 (1952)		
		234.1131±10	Adjusted value in NYO-981.		
	Accumulative Decay Energy	234.11341		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{92}U^{235}$					
	Fermi Formula	235.11240			
	Q-Value	235.1156±10	U^{235} (α) Th^{231} Th^{232} (γ, n) Th^{231}	Th^{232} = 232.1093±10	G. S. Stanford et al Phys. Rev. 85, 1039 (1952); H. E. Duckworth NYO-981, 4-18-52
	Accumulative Decay Energy	235.11668		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
			Neutron Binding Energies:		
				$Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{92}U^{236}$					
	Fermi Formula	236.11408			
	Accumulative Decay Energy	236.11880		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
			Neutron Binding Energies:		
				$Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{92}U^{237}$					
	Fermi Formula	237.11705			
	Accumulative Decay Energy	237.12199		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{92}U^{238}$					
	Fermi Formula	238.11895			
	Mass Spectra	238.1234±10	Sn^{119} - U^{238}	Sn^{119} = 118.94048±43	G. S. Stanford et al Phys. Rev. 85, 1039 (1952); H. E. Duckworth NYO-981, 4-18-52
		238.1241±10	Adjusted Value		
	Accumulative Decay Energy	238.12454			
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{92}U^{239}$	Fermi Formula	239.12214			
	Accumulative Decay Energy	239.12833		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{92}U^{240}$	Fermi Formula	240.12426			
	Accumulative Decay Energy	240.13101		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{93}Np^{231}$					
	Fermi Formula	231.10604			
	Accumulative Decay Energy	231.10989		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{93}Np^{232}$					
	Fermi Formula	232.10814			
	Accumulative Decay Energy	232.11193		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{93}Np^{233}$					
	Fermi Formula	233.10915			
	Accumulative Decay Energy	233.11284		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{93}Np^{234}$					
	Fermi Formula	234.11148			
	Accumulative Decay Energy	234.11540		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{93}Np^{235}$					
	Fermi Formula	235.11273			
	Accumulative Decay Energy	235.11687		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
			Neutron Binding Energies:		
			$Pb^{206-207}$ = 6.73 Mev		
			$Pb^{207-208}$ = 7.38 Mev		
			$Pb^{208-209}$ = 3.87 Mev		
$_{93}Np^{236}$					
	Fermi Formula	236.11529			
	Accumulative Decay Energy	236.11978		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
			Neutron Binding Energies:		
			$Pb^{206-207}$ = 6.73 Mev		
			$Pb^{207-208}$ = 7.38 Mev		
			$Pb^{208-209}$ = 3.87 Mev		

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{93}Np^{237}$	Fermi Formula	237.11677			
	Accumulative Decay Energy	237.12143		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{93}Np^{238}$	Fermi Formula	238.11956			
	Accumulative Decay Energy	238.12464		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{93}Np^{239}$	Fermi Formula	239.12127			
	Accumulative Decay Energy	239.12695		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{93}Np^{240}$	Fermi Formula	240.12427			
	Accumulative Decay Energy	240.13063		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{93}Np^{241}$					
	Fermi Formula	241.12620			
	Accumulative Decay Energy	241.13281	(Value uncertain)	Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{94}Pu^{232}$					
	Fermi Formula	232.10910			
	Accumulative Decay Energy	232.11300		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{94}Pu^{234}$	Fermi Formula	234.11183			
	Accumulative Decay Energy	234.11592		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{94}Pu^{235}$	Fermi Formula	235.11397			
	Accumulative Decay Energy	235.11809		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{94}Pu^{236}$					
	Fermi Formula	236.11503			
	Accumulative Decay Energy	236.11922		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{94}Pu^{237}$					
	Fermi Formula	237.11740			
	Accumulative Decay Energy	237.12168		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{94}Pu^{238}$					
	Fermi Formula	238.11870			
	Accumulative Decay Energy	238.12328		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{94}Pu^{239}$					
	Fermi Formula	239.12129			
	Accumulative Decay Energy	239.12618		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{94}Pu^{240}$					
	Fermi Formula	240.12282			
	Accumulative Decay Energy	240.12831		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{94}Pu^{241}$					
	Fermi Formula	241.12563			
	Accumulative Decay Energy	241.13137		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{94}Pu^{242}$					
	Fermi Formula	242.12739			
	Accumulative Decay Energy	242.13375		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{94}Pu^{243}$					
	Fermi Formula	243.13042			
	Accumulative Decay Energy	243.13726		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{95}Am^{237}$	Fermi Formula	237.11893			
	Accumulative Decay Energy	237.12327		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{95}Am^{238}$	Fermi Formula	238.12111			
	Accumulative Decay Energy	238.12571		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{95}Am^{239}$					
	Fermi Formula	239.12222			
	Accumulative Decay Energy	239.12702		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
			Neutron Binding Energies:		
				$Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{95}Am^{240}$					
	Fermi Formula	240.12462			
	Accumulative Decay Energy	240.12988		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
			Neutron Binding Energies:		
				$Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{94}Am^{241}$					
	Fermi Formula	241.12596			
	Accumulative Decay Energy	241.13135		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{95}Am^{242}$					
	Fermi Formula	242.12859			
	Accumulative Decay Energy	242.13445		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{95}Am^{243}$	Fermi Formula	243.13015			
	Accumulative Decay Energy	243.13665		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
			Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev		
$_{95}Am^{244}$	Fermi Formula	244.13299			
	Accumulative Decay Energy	244.14011		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
			Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev		

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{95}Am^{245}$					
	Fermi Formula	245.13478			
	Accumulative Decay Energy	245.14207		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{96}Cm^{238}$					
	Fermi Formula	238.12204			
	Accumulative Decay Energy	238.12691		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{96}Cm^{239}$	Fermi Formula	239.12403			
	Accumulative Decay Energy	239.12894		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{96}Cm^{240}$	Fermi Formula	240.12496			
	Accumulative Decay Energy	240.12994		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{96}Cm^{241}$					
	Fermi Formula	241.12717			
	Accumulative Decay Energy	241.13230		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{96}Cm^{242}$					
	Formi Formula	242.12833			
	Accumulative Decay Energy	242.13382		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{96}Cm^{243}$					
	Fermi Formula	243.13077			
	Accumulative Decay Energy	243.13665		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{96}Cm^{244}$					
	Fermi Formula	244.13215			
	Accumulative Decay Energy	244.13850		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{96}Cm^{245}$					
	Fermi Formula	245.13482			
	Accumulative Decay Energy	245.14138		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{97}Bk^{243}$					
	Fermi Formula	243.13227			
	Accumulative Decay Energy	243.13822		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{97}Bk^{244}$					
	Fermi Formula	244.13453			
	Accumulative Decay Energy	244.14087		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{97}Bk^{245}$					
	Fermi Formula	245.13573			
	Accumulative Decay Energy	245.14213		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{97}Bk^{246}$					
	Fermi Formula	246.13820			
	Accumulative Decay Energy	246.14499		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{97}Bk^{249}$					
	Fermi Formula	249.14396			
	Accumulative Decay Energy	249.15186		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{97}Bk^{250}$					
	Fermi Formula	250.14685			
	Accumulative Decay Energy	250.15599		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{98}Cf^{244}$					
	Fermi Formula	244.13545			
	Accumulative Decay Energy	244.14162		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{98}Cf^{246}$	Fermi Formula	246.13854			
	Accumulative Decay Energy	246.14506		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{98}Cf^{247}$	Fermi Formula	247.14083			
	Accumulative Decay Energy	247.14762		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{98}Cf^{248}$					
	Fermi Formula	248.14207			
	Accumulative Decay Energy	248.14920		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{98}Cf^{249}$					
	Fermi Formula	249.14458			
	Accumulative Decay Energy	249.15180		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{98}Cf^{250}$					
	Fermi Formula	250.14605			
	Accumulative Decay Energy	250.15395		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
$_{98}Cf^{251}$					
	Fermi Formula	251.14877			
	Accumulative Decay Energy	251.15725	(Value uncertain)	Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
$_{98}Cf^{252}$	Fermi Formula	252.15045			
	Accumulative Decay Energy	252.15988	(Value uncertain)	Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
$_{99}^{253}$	Fermi Formula	253.15372			
	Accumulative Decay Energy	253.16296		Pb^{208} = 208.04100 He^{4} = 4.00387 n = 1.00898 Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published

	Method	Mass	Reaction or Doublet	Reference Masses	References
254					
99	Fermi Formula	254.15647			
	Accumulative Decay Energy	254.16688		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
255					
99	Fermi Formula	255.15818			
	Accumulative Decay Energy	255.16918	(Value uncertain)	Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

	Method	Mass	Reaction or Doublet	Reference Masses	References
254					
100	Fermi Formula	254.15625			
	Accumulative Decay Energy	254.16570		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	
255					
100	Fermi Formula	255.15882			
	Accumulative Decay Energy	255.16886		Pb^{208} = 208.04100 He^4 = 4.00387 n = 1.00898	G. T. Seaborg, R. A. Glass, S. G. Thompson, J. A. C. S., to be published
				Neutron Binding Energies: $Pb^{206-207}$ = 6.73 Mev $Pb^{207-208}$ = 7.38 Mev $Pb^{208-209}$ = 3.87 Mev	

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