

^{89}Zr $Z = 40$ $N = 49$ adopted link ENSDF link

Based on ENSDF from Oct 2022, and mass evaluation from 2020

BE = 771.931 (0.003) MeV

Qbeta+ = 2.833 (0.003) MeV

	Energy T	J+	J-	J-other	T1/2		
89ZR	1	0.000	9/2+			1	78.41 H 12
89ZR	2			0.588	1/2-	2	4.161 M 10
89ZR	3			1.095	3/2-	3	0.05 PS GT
89ZR	4			1.451	5/2-	4	3.5 PS GT
89ZR	5					5	0.53 PS 10
89ZR	6	1.627	5/2+			6	0.35 PS 7
89ZR	7			1.743	1/2-	7	0.43 PS 10
89ZR	8	1.834	5/2+			8	0.46 PS 12
89ZR	9			1.865	3/2-	9	0.17 PS 3
89ZR	10	1.944	13/2+			10	0.74 PS 11
89ZR	11					11	2 PS GT
89ZR	12			2.100	5/2-	12	0.076 PS 14
89ZR	13					13	104 FS 14
89ZR	14			2.121	13/2-	14	2.23 NS 12
89ZR	15					15	
89ZR	16	2.131	5/2+			16	
89ZR	17					17	
89ZR	18					18	3.6 NS LE
89ZR	19					19	
89ZR	20					20	3.6 NS LE
89ZR	21					21	24 FS 7
89ZR	22					22	
89ZR	23					23	83 FS 14
89ZR	24					24	0.13 PS 4
89ZR	25					25	
89ZR	26					26	2.5 PS +28-7
89ZR	27					27	
89ZR	28					28	
89ZR	29					29	0.10 PS 4
89ZR	30					30	90 FS 21
89ZR	31	2.612	9/2+			31	
89ZR	32					32	
89ZR	33	2.724	17/2+			33	11 PS 3
89ZR	34					34	
89ZR	35					35	
89ZR	36					36	0.35 PS 19
89ZR	37					37	

89ZR	38				2.783	(5/2,7/2)+	38		
89ZR	39				2.830		39		
89ZR	40				2.890	(7/2,9/2)+	40		

89ZR	41				2.926	7/2+,9/2+	41		
89ZR	42				2.927	(19/2-)	42		
89ZR	43				2.927	(1/2:11/2)-	43		
89ZR	44				2.960	(7/2)-	44		
89ZR	45				2.981	(7/2,9/2,11/2)	45		
89ZR	46		2.995	21/2+			46	5.14 NS	16
89ZR	47		2.996	5/2+			47		
89ZR	48			3.016	7/2-		48		
89ZR	49				3.019	(7/2,9/2)+	49		
89ZR	50				3.049	(-)	50		

89ZR	51				3.093	(7/2)+	51		
89ZR	52				3.106	(-)	52		
89ZR	53				3.111	(19/2)+	53	2.8 PS	GT
89ZR	54		3.141	9/2+			54		
89ZR	55				3.153	(1/2:9/2)+	55		
89ZR	56		3.181	5/2+			56		
89ZR	57				3.214	(-)	57		
89ZR	58				3.269	(1/2:9/2)+	58		
89ZR	59		3.280	5/2+			59		
89ZR	60				3.281	7/2+,9/2+	60		

89ZR	61				3.339	1/2-,3/2-	61		
89ZR	62		3.372	9/2+			62		
89ZR	63				3.420	(1/2:9/2)+	63		
89ZR	64				3.467	(7/2,9/2,11/2)	64		
89ZR	65				3.487	(7/2,9/2)+	65		
89ZR	66				3.513	(7/2,9/2)+	66		
89ZR	67				3.531	(7/2-)	67		
89ZR	68				3.534	(7/2+,9/2+)	68		
89ZR	69				3.557	(7/2,9/2)+	69		
89ZR	70				3.576	(5/2)-	70		

89ZR	71				3.577	(23/2)+	71	0.35 PS	10
89ZR	72				3.597	(7/2,9/2)+	72		
89ZR	73				3.600		73		
89ZR	74		3.625	5/2+			74		
89ZR	75				3.647	(1/2:9/2)+	75		
89ZR	76				3.717	(21/2-)	76	0.8 PS	LE
89ZR	77			3.765	5/2-		77		
89ZR	78				3.837	7/2+,9/2+	78		
89ZR	79				3.907	(7/2-,9/2-)	79		
89ZR	80				3.931	(7/2,9/2,11/2)	80		

89ZR	81				3.948	(7/2,9/2,11/2)	81		
89ZR	82				3.966	(7/2)-	82		

89ZR 83				4.100	7/2-					83	
89ZR 84							4.200	5/2-, 7/2-		84	
89ZR 85							4.278	(25/2+)		85 0.06 PS LE	
89ZR 86				4.280	7/2-					86	
89ZR 87							4.360	(1/2-, 3/2-)		87	
89ZR 88							4.524	(23/2-)		88	
89ZR 89				4.590	7/2-					89	
89ZR 90				4.680	7/2-					90	

89ZR 91							4.730	3/2+, 5/2+		91	
89ZR 92		4.738		25/2+						92 6 PS LE	
89ZR 93				4.900	7/2-					93	
89ZR 94							5.000	(1/2-, 3/2-)		94	
89ZR 95				5.100	7/2-					95	
89ZR 96							5.170	(3/2+, 5/2+)		96	
89ZR 97				5.170	7/2-					97	
89ZR 98							5.286			98	
89ZR 99				5.300	7/2-					99	
89ZR 100							5.381	(27/2)+		100 0.7 PS GT	

89ZR 101							5.495	(25/2-)		101	
89ZR 102				5.500	7/2-					102	
89ZR 103							5.600	7/2-&3/2-		103	
89ZR 104							5.730	7/2-&3/2-		104	
89ZR 105							5.735	(25/2)		105	
89ZR 106							5.752	(27/2)+		106	
89ZR 107							5.955	7/2-&3/2-		107	
89ZR 108							6.028	(27/2+)		108	
89ZR 109							6.073	(27/2)-		109	
89ZR 110							6.100	7/2-&3/2-		110	

89ZR 111							6.109	(29/2+)		111	

S-alpha=	6.200	(0.004)	-----							
89ZR 112							6.243	(29/2-)		112	
89ZR 113							6.280	7/2-&3/2-		113	
89ZR 114							6.353	(29/2)		114	
89ZR 115							6.520	7/2-&3/2-		115	
89ZR 116				6.700	7/2-					116	
89ZR 117							6.832	(31/2-)		117	
89ZR 118							6.900	5/2-, 7/2-		118	
89ZR 119							6.953	(31/2)		119	
89ZR 120							6.963	(29/2)+		120	

89ZR 121							7.060	(5/2-, 7/2-)		121	
89ZR 122							7.200	(5/2-, 7/2-)		122	
89ZR 123							7.419	(31/2+)		123	
89ZR 124							7.507	(33/2-)		124	

S-p =	7.868	(0.003)	-----							
89ZR 125							8.015	(35/2-)		125	
89ZR 126				8.105	1/2-					126	

89ZR 127				8.107	(33/2+)	127
89ZR 128				8.864	(35/2+)	128
89ZR 129		9.035	9/2+			129
89ZR 130				9.200	(7/2-)	130

89ZR 131				9.300		131
S-n	=	9.320	(0.006)	-----		
89ZR 132				9.500	(3/2+)&(1/2+)	132
89ZR 133				9.601	(37/2+)	133
89ZR 134		9.620	3/2-			134
89ZR 135		9.860	5/2-			135
S-p	=	7.868	(0.003)	-----		
S-n	=	9.320	(0.006)	-----		
S-2p	=	14.576	(0.003)	-----		
S-2n	=	21.674	(0.005)	-----		
S-alpha	=	6.200	(0.004)	-----		
S+p	=	-5.073	(0.004)			
S+n	=	-11.966	(0.003)			
S+2p	=	-11.909	(0.007)			
S+2n	=	-19.160	(0.003)			
S+alpha	=	-4.354	(0.003)			
gap p	=	2.795	(0.005)			
gap n	=	-2.645	(0.007)			
gap 2p	=	2.667	(0.007)			
gap 2n	=	2.513	(0.006)			
gap alpha	=	1.846	(0.005)			