

^{139}Pr $Z = 59$ $N = 80$ adopted link ENSDF link

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

BE = 1160.583 (0.004) MeV

Qbeta+ = 2.129 (0.004) MeV

	Energy T	J+	J-	J-other	T1/2
139PR 1	0.000	5/2+			1 4.41 H 4
139PR 2	0.114	7/2+			2 2.60 NS 8
139PR 3	0.405	3/2+			3
139PR 4	0.589	5/2+			4

S-alpha=	0.610 (0.010)				
139PR 5				0.624	5
139PR 6			0.822	11/2-	6 43.4 NS 16
139PR 7	0.828	9/2+			7
139PR 8	0.852	11/2+			8
139PR 9				0.917	(1/2,3/2,5/2)+ 9
139PR 10				1.009	10

139PR 11	1.024	9/2+			11
139PR 12				1.074	(1/2+,3/2,5/2) 12
139PR 13				1.124	13
139PR 14				1.154	14
139PR 15			1.312	1/2-	15
139PR 16				1.328	(3/2+,5/2) 16
139PR 17				1.370	(9/2-,13/2-) 17
139PR 18				1.406	(1/2+,3/2,5/2) 18
139PR 19			1.449	3/2-	19
139PR 20				1.478	20

139PR 21				1.492	21
139PR 22				1.501	(1/2+,3/2,5/2) 22
139PR 23			1.523	13/2-	23
139PR 24				1.532	(1/2+,3/2,5/2) 24
139PR 25				1.584	25
139PR 26			1.624	9/2-	26
139PR 27	1.650	1/2+			27
139PR 28			1.722	15/2-	28
139PR 29				1.762	29
139PR 30	1.790	13/2+			30

139PR 31				1.834	(9/2-,11/2-) 31
139PR 32				1.857	32
139PR 33				1.868	(15/2)+ 33
139PR 34	1.908	7/2+			34
139PR 35				1.927	(11/2,13/2)- 35
139PR 36			1.942	17/2-	36

139PR 37						1.942				37
139PR 38		1.952	5/2+							38
139PR 39						1.975				39
139PR 40						2.030				40

139PR 41						2.049	9/2-, 11/2-			41
139PR 42						2.050				42
139PR 43						2.097				43
139PR 44						2.127				44
139PR 45						2.149				45
139PR 46					2.174	9/2-				46
139PR 47						2.187	(19/2)-		9 NS	AP
139PR 48						2.196	9/2-, 11/2, 13/2-			48
139PR 49						2.206				49
139PR 50						2.278	(19/2)-			50

139PR 51						2.292	9/2, 11/2, 13/2+			51
139PR 52						2.367	(21/2)-			52
139PR 53						2.456				53
139PR 54						2.481				54
139PR 55						2.660				55
139PR 56						2.701				56
139PR 57					2.726	19/2-				57
139PR 58						2.741				58
139PR 59						2.761	(19/2-)			59
139PR 60						2.800				60

139PR 61						2.821	(21/2)+			61
139PR 62						2.986	(21/2-)			62
139PR 63						3.021	(23/2+)			63
139PR 64						3.139	(25/2)-			64
139PR 65						3.204				65
139PR 66						3.256	(25/2)-			66
139PR 67						3.266	(23/2)+			67
139PR 68						3.484				68
139PR 69						3.565	(23/2)-			69
139PR 70						3.580	(25/2+)			70

139PR 71						3.627	(25/2+)			71
139PR 72						3.698	(25/2-)		12 NS	AP
139PR 73						3.972	(27/2+)			73
139PR 74						4.052	(25/2-)			74
139PR 75						4.101	(27/2-)			75
139PR 76						4.276	(27/2)+			76
139PR 77						4.317	(29/2-)			77
139PR 78						4.377				78
139PR 79						4.412	(27/2)+			79
139PR 80						4.444	(27/2)+			80

139PR 81						4.537	(29/2-)			81

S-p = 4.552 (0.004)-----					
139PR 82			4.626	(29/2)+	82
139PR 83			4.834	(29/2+)	83
139PR 84			4.863	(31/2-)	84
139PR 85			4.906	(31/2)+	85
139PR 86			4.947	(33/2-)	86
139PR 87			5.056	(31/2+)	87
139PR 88			5.171	(33/2-)	88
139PR 89			5.222	(31/2)-	89
139PR 90			5.283	(33/2+)	90

139PR 91			5.364	(33/2)-	91
139PR 92			5.406	(33/2-)	92
139PR 93			5.558	(35/2-)	93
139PR 94			5.586	(35/2-)	94
139PR 95			5.633	(37/2)-	95
139PR 96			5.671	(33/2-)	96
139PR 97			5.741	(35/2)+	97
139PR 98			5.824	(35/2-)	98
139PR 99			5.862	(35/2)-	99
139PR 100			6.039	(35/2)-	100

139PR 101			6.118	(37/2)-	101
139PR 102			6.183	(37/2-)	102
139PR 103			6.282	(37/2+)	103
139PR 104			6.317	(37/2-)	104
139PR 105			6.371	(41/2)-	105
139PR 106			6.387	(39/2-)	106
139PR 107			6.400	(39/2)-	107
139PR 108			6.525	(37/2-)	108
139PR 109			6.720	(39/2-)	109
139PR 110			6.736	(41/2)-	110

139PR 111			6.773	(37/2-)	111
139PR 112			6.854	(39/2-)	112
139PR 113			6.916	(39/2+)	113
139PR 114			6.938	(41/2-)	114
139PR 115			7.219	(45/2-)	115
139PR 116			7.220	(41/2-)	116

S-p = 4.552 (0.004)-----
S-n = 9.771 (0.011)-----
S-2p = 12.266 (0.004)-----
S-2n = 17.770 (0.009)-----
S-alpha= 0.610 (0.010)-----

S+p = -6.718 (0.005)
S+n = -7.929 (0.007)
S+2p = -10.272 (0.014)

S+2n = -17.328 (0.004)
S+alpha = -0.557 (0.005)

gap p = -2.166 (0.006)
gap n = 1.842 (0.013)
gap 2p = 1.994 (0.015)
gap 2n = 0.441 (0.010)
gap alpha = 0.053 (0.011)