

^{164}Hf $Z = 72$ $N = 92$ adopted link ENSDF link

Based on ensdf_240402 (Apr 2024), and mass evaluation from 2020

BE = 1319.186 (0.016) MeV

Qbeta+ = 2.824 (0.032) MeV

	Energy T	J+	J-	J-other	T1/2

S-alpha=	-3.920	(0.017)	-----		

164HF 1	0.000	0+			1 111 S 8
164HF 2	0.211	2+			2 301 PS 29
164HF 3	0.587	4+			3 13.0 PS +26-22
164HF 4				0.620	4
164HF 5	0.816	(2+)			5
164HF 6				1.073 (2+,3,4+)	6
164HF 7	1.085	6+			7 2.0 PS +26-4
164HF 8				1.238	8
164HF 9				1.353 (2+,3,4+)	9
164HF 10				1.458	10

164HF 11				1.486	11
164HF 12			1.521 (5-)		12
164HF 13			1.615 (4-)		13
164HF 14	1.669	8+			14 1.4 PS LT
164HF 15				1.676	15
164HF 16			1.836 (7-)		16
164HF 17			1.947 (6-)		17
164HF 18			2.245 (9-)		18
164HF 19			2.302 (8-)		19
164HF 20	2.304	10+			20

164HF 21			2.576 (10-)		21
164HF 22			2.698 (11-)		22 3.0 PS +16-10
164HF 23	2.871	12+			23 5.2 PS +15-12
164HF 24			2.961 (12-)		24
164HF 25	2.994	(12+)			25
164HF 26			3.155 (13-)		26 4.1 PS +12-10
164HF 27	3.210	14+			27 14.8 PS +10-12
164HF 28			3.301 (13-)		28
164HF 29			3.493 (14-)		29
164HF 30	3.618	(14+)			30

164HF 31	3.678	16+			31 2.9 PS +10-7
164HF 32			3.700 (15-)		32
164HF 33			3.944 (15-)		33
164HF 34			4.129 (16-)		34
164HF 35	4.262	18+			35 2.1 PS +12-10

S-p	=	4.316	(0.032)	-----			
164HF	36			4.335	(17-)		36
164HF	37			4.614	(17-)		37
164HF	38			4.766	(18-)		38
164HF	39		4.939	20+			39
164HF	40			5.009	(19-)		40

164HF	41			5.259	(19-)		41
164HF	42			5.359	(20-)		42
164HF	43			5.669	(21-)		43
164HF	44		5.699	22+			44
164HF	45			5.894	(21-)		45
164HF	46			5.982	(22-)		46
164HF	47			6.335	(23-)		47
164HF	48		6.544	24+			48
S-2p	=	6.575	(0.022)	-----			
164HF	49			6.602	(23-)		49
164HF	50			6.673	(24-)		50

164HF	51			7.062	(25-)		51
164HF	52			7.350	(25-)		52
164HF	53			7.443	(26-)		53
164HF	54		7.458	26+			54
164HF	55			7.873	(27-)		55
164HF	56			8.166	(27-)		56
164HF	57			8.292	(28-)		57
164HF	58		8.436	28+			58
164HF	59			8.764	(29-)		59
164HF	60			8.990	(29-)		60

164HF	61			9.084	(29-)		61
164HF	62			9.215	(30-)		62
164HF	63		9.418	30+			63
164HF	64			9.726	(31-)		64
164HF	65			9.770	(31-)		65
164HF	66			10.190	(32-)		66
164HF	67			10.228	(32-)		67
164HF	68		10.411	32+			68
164HF	69			10.599	(33-)		69
S-n	=	10.620	(0.030)	-----			
164HF	70			10.754	(33-)		70

164HF	71			11.074	(34-)		71
164HF	72			11.257	(34-)		72
164HF	73		11.428	34+			73
164HF	74			11.495	(35-)		74
164HF	75			11.784	(35-)		75
164HF	76			12.006	(36-)		76
164HF	77			12.307	(36-)		77
164HF	78			12.450	(37-)		78

164HF	79	12.482	36+				79
164HF	80			12.787	(37-)		80

164HF	81			12.992	(38-)		81
164HF	82			13.391	(38-)		82
164HF	83			13.467	(39-)		83
164HF	84			13.802	(39-)		84
164HF	85			14.027	(40-)		85
164HF	86			14.540	(41-)		86
164HF	87			14.851	(41-)		87
164HF	88			15.106	(42-)		88
164HF	89			15.665	(43-)		89
164HF	90			16.232	(44-)		90

164HF	91			16.830	(45-)		91
164HF	92			17.413	(46-)		92
164HF	93			18.643	(48-)		93

S-p = 4.316 (0.032) -----
 S-n = 10.620 (0.030) -----
 S-2p = 6.575 (0.022) -----
 S-2n = 18.793 (0.018) -----
 S-alpha= -3.920 (0.017) -----

S+p = -1.318 (0.021)
 S+n = -7.888 (0.032)
 S+2p = -4.647 (0.018)
 S+2n = -18.183 (0.032)
 S+alpha = 4.501 (0.021)

gap p = 2.997 (0.038)
 gap n = 2.732 (0.044)
 gap 2p = 1.928 (0.029)
 gap 2n = 0.609 (0.037)
 gap alpha = 0.581 (0.027)