

^{164}Hf $Z = 72$ $N = 92$ [link to full NNDC output](#)

Based on ENSDF from Dec 2018, and mass evaluation from 2016

BE = 1319.186 (0.016) MeV

Qbeta+ = 2.824 (0.032) MeV

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

S-alpha=	-3.919	(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	=	6.570	(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	=	10.626	(0.029)	-----				
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 = 10.626 (0.029)-----
 S-2p = 6.570 (0.022)-----
 S-2n = 18.792 (0.018)-----
 S-alpha= -3.919 (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 = 4.500 (0.021)

gap p = 2.998 (0.038)
 gap n = 2.738 (0.043)
 gap 2p = 1.923 (0.029)
 gap 2n = 0.609 (0.037)
 gap alpha = 0.581 (0.027)