

¹⁷⁶Hf(α ,t) 2006Bu19

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 159, 1 (2019)	30-Aug-2019

E(³He)=32 MeV. 77.49% enriched in ¹⁷⁶Hf target. The tritons were analyzed by Enge split-pole magnetic spectrograph and detected with photographic emulsion plates. FWHM=15-20 keV. Measured: $\sigma(\theta)$ at 10 angles from 7.5° to 50°. DWBA analysis. Deduced: L-transfer values and spectroscopic factors.

¹⁷⁷Ta Levels

Cross sections listed under comments are at 60°.

E(level) [†]	J ^{π} [†]	S ^a	Comments
0.0 ^{&}	7/2 ⁺	0.53	d σ /d Ω =29 μ b/sr 2.
70.5	5/2 ⁺	0.77	E(level): Rounded off value from the Adopted Levels. J ^{π} ,L,S: Doublet. This level have small admixture from the known 73.4-keV, 9/2 ⁻ , π 9/2[514] level with S(theory)=0.01. d σ /d Ω =74 μ b/sr 2. configuration: π 5/2[402].
130 ^{&} 2	9/2 ⁺		d σ /d Ω =2 μ b/sr 1.
185 [‡] 1	5/2 ⁻	0.24	d σ /d Ω =28 μ b/sr 2.
220 [‡] 1	1/2 ⁻ & 11/2 ⁻	≈0.81	E(level): Doublet. S: for J ^{π} =11/2 ⁻ . configuration: π 9/2[514] for the second component. d σ /d Ω =54 μ b/sr 2.
245 [‡] 1	9/2 ⁻	0.71	d σ /d Ω =36 μ b/sr 2.
286 1			d σ /d Ω =2 μ b/sr 1.
372 [‡] 2	3/2 ⁻	0.03	d σ /d Ω =4 μ b/sr 1.
497 [#] 1	1/2 ⁺ & 3/2 ⁺	0.10	E(level): Doublet. Both components are assigned to the π 1/2[411] band. d σ /d Ω =7 μ b/sr 1. S: for 3/2 ⁺ component.
524 [‡] 1	(7/2 ⁻)	0.09	d σ /d Ω =10 μ b/sr 1. Band assignment is uncertain.
641 [#] 2	5/2 ⁺	0.04	d σ /d Ω =3 μ b/sr 1.
690.3?	(3/2 ⁻)	≤0.03	E(level),J ^{π} : From Adopted Levels. d σ /d Ω ≤2 μ b/sr. configuration: π 3/2[532].
738 [‡] 1	11/2 ⁻		d σ /d Ω =8 μ b/sr 1, contains significant contribution from a peak assigned to ¹⁷⁹ Ta.
898 1			d σ /d Ω =6 μ b/sr 1.
1011 1			d σ /d Ω =13 μ b/sr 1.
1046 [@] 2	3/2 ⁻	0.17	d σ /d Ω =13 μ b/sr 1.
1086?			d σ /d Ω ≤3 μ b/sr.
1120 2			d σ /d Ω =19 μ b/sr 2.
1162 [@] 2	7/2 ⁻	0.52	d σ /d Ω =45 μ b/sr 2.
1264 2			d σ /d Ω =26 μ b/sr 2.
1341 2			d σ /d Ω =4 μ b/sr 1.
1365 2			d σ /d Ω =17 μ b/sr 2.
1447 3			d σ /d Ω =7 μ b/sr 1.
1488 3			d σ /d Ω =4 μ b/sr 1.
1510?			d σ /d Ω ≤2 μ b/sr.
1638 4			d σ /d Ω ≈3 μ b/sr.
1804 2			d σ /d Ω =15 μ b/sr 2.

Continued on next page (footnotes at end of table)

 ${}^{176}\text{Hf}(\alpha, t)$ **2006Bu19 (continued)**

 ${}^{177}\text{Ta}$ Levels (continued)

† From [2006Bu19](#). The level energies were measured relative to the 70.6-keV level, rounded off value from the Adopted Levels. The uncertainties are statistical only, the calibration uncertainty is ≤ 1 keV up to ≈ 1 MeV, but increases to as much as ≈ 10 keV at ≈ 2.5 MeV excitation energy.

‡ Band(A): $\pi 1/2[541]$ band.

Band(B): $\pi 1/2[411]$ band.

@ Band(C): $\pi 1/2[530]$ band.

& Band(D): $\pi 7/2[404]$ band.

^a Defined as $[\text{d}\sigma/\text{d}\Omega(\text{exp})]/[2\text{N}\times\text{d}\sigma/\text{d}\Omega(\text{DW})]$ with $\text{N}=102$. See [2006Bu19](#) for details.

$^{176}\text{Hf}(\alpha, t)$ 2006Bu19Band(C): $\pi 1/2[530]$ band7/2⁻ 11623/2⁻ 1046Band(A): $\pi 1/2[541]$ band11/2⁻ 738Band(B): $\pi 1/2[411]$ band5/2⁺ 641(7/2⁻) 5241/2⁺ & 3/2⁺ 4973/2⁻ 3729/2⁻ 2451/2⁻ & 11/2⁻ 2205/2⁻ 185Band(D): $\pi 7/2[404]$ band9/2⁺ 1307/2⁺ 0.0