

¹⁶⁸Yb(d,t) **1966Bu16**

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 191,1 (2023)	22-Aug-2023

1966Bu16: E(d)=12 MeV from Niels Bohr Institute Tandem Accelerator. Target was ≈99% enriched with a thickness of ≈40 μg/cm² evaporated on carbon backing. Measured triton spectra by analyzing particles using a single gap, broad range, magnetic spectrograph with an overall energy resolution of 0.1%, and recorded on photographic plates. Deduced absolute differential cross sections at five angles, with ≈15% uncertainty in absolute and ≈20% in relative cross sections. DWBA calculations of differential cross sections, based on which, six levels interpreted in terms of Nilsson model states.

¹⁶⁷Yb Levels

Measured Q(d,t)=-2797 keV 12.

Listed cross sections in Table 2 of **1966Bu16** seem to be relative.

E(level) [†]	J ^π #	Comments
0 [@]	5/2 ⁻	dσ/dΩ: 9 (56°), ≈5 (60°), 13 (85°).
30 3		dσ/dΩ: 5 (56°), ≈4 (60°), ≈3 (85°).
59 3		J ^π : assigned as 5/2 ⁺ , ν5/2[642] by 1975Li03 on the basis of cross-section data in 1966Bu16 .
		dσ/dΩ: 15 (56°), 17 (60°), 34 (85°), 28 (90°).
		J ^π : assigned as 9/2 ⁺ , ν5/2[642] by 1975Li03 on the basis of cross-section data in 1966Bu16 .
79 [@] 3	7/2 ⁻	dσ/dΩ: ≈2 (56°), ≈3 (60°), 7 (85°).
187 ^{&} 3	9/2 ⁻ & 3/2 ⁻	E(level): doublet, identified with ≈180 and 187 levels by 1966Bu16 .
		dσ/dΩ: 49 (56°), 45 (60°), 90 (85°), 96 (90°), 78 (125°).
		J ^π : Tentative assignment to the two Nilsson configurations. Other: assigned as 13/2 ⁺ , ν5/2[642] by 1975Li03 on basis of cross-section data in 1966Bu16 . In the Adopted Levels, 9/2 ⁻ , ν5/2[523] is assigned to a 178.9 level and (3/2 ⁻), ν3/2[521] to a 179.8 level.
212 ^a 3	(1/2 ⁻)	dσ/dΩ: 42 (56°), 52 (60°), 62 (85°), 55 (90°), 40 (125°).
		J ^π : 1/2 ⁻ , ν1/2[521] assignment to a 188.8 level in the Adopted Levels.
258 3		dσ/dΩ: 12 (56°), 10 (60°), 12 (85°), 19 (90°).
277 3		dσ/dΩ: 4 (56°), 6 (60°), 12 (85°).
316 ^{&} 3	7/2 ⁻	dσ/dΩ: 50 (56°), 64 (60°), 98 (85°), 124 (90°), 89 (125°).
408 ^{‡a} 3	9/2 ⁻ & (7/2 ⁻)	E(level): doublet, with tentative assignment for both the bands.
		dσ/dΩ: ≈7 (56°), 12 (85°), ≈22 (125°).
		E(level),J ^π : doublet, with tentative assignments of 9/2 ⁻ , ν3/2[521] and 7/2 ⁻ , ν1/2[521]. In the Adopted Levels, a 419.6 level is assigned (9/2 ⁻), ν3/2[521], and a 440.7 level to 7/2 ⁻ , ν1/2[521] configuration.
477 [‡] 3		dσ/dΩ: 2 (85°).
545 [‡] 3		dσ/dΩ: ≈4 (85°).
566 3		dσ/dΩ: ≈40 (56°), 44 (60°), 89 (85°), 82 (90°).
601 [‡] 3		dσ/dΩ: ≈4 (56°).
614 3		dσ/dΩ: ≈26 (56°), 30 (60°), ≈60 (85°), 62 (90°).
660 3		dσ/dΩ: 9 (60°), 10 (85°).
692 [‡] 3		dσ/dΩ: ≈4 (85°).
752 3		dσ/dΩ: ≈22 (56°), 21 (60°), 52 (85°), 47 (90°).
801 [‡] 3		dσ/dΩ: ≈2 (85°).
835 3		dσ/dΩ: 5 (60°), ≈8 (85°), ≈10 (90°).
966 3		dσ/dΩ: 24 (56°), ≈33 (60°), 28 (85°).

[†] Level energies are the averages of the values obtained from the angles, and the uncertainties are stated by **1966Bu16** as less than 2 or 3 keV for low-lying states (<1.5 MeV). Evaluators assign 3 keV.

[‡] Uncertain assignment to ¹⁶⁷Yb as indicated in Fig. 12 of **1966Bu16**, due to very weak population. This level may possibly be due to heavy impurities.

 $^{168}\text{Yb}(\text{d,t})$ **1966Bu16** (continued) ^{167}Yb Levels (continued)

From a comparison of relative cross sections with Nilsson-model predictions, 'Finger-print' method, however, uncertainties are large in the relative as well as absolute cross sections, which may reflect on the interpretation of level structure.

@ Band(A): Tentative $\nu 5/2[523]$.

& Band(B): $\nu 3/2[521]$.

^a Band(C): Tentative $\nu 1/2[521]$.

 $^{168}\text{Yb}(\text{d,t})$ **1966Bu16**

Band(B): v3/2[521]	Band(C): Tentative v1/2[521]
<u>9/2⁻ & (7/2⁻)</u> 408	<u>9/2⁻ & (7/2⁻)</u> 408

7/2⁻ **316**

Band(A): Tentative v5/2[523]	<u>(1/2⁻)</u> 212
<u>9/2⁻ & 3/2⁻</u> 187	<u>9/2⁻ & 3/2⁻</u> 187

7/2⁻ **79**

5/2⁻ **0**

 $^{167}_{70}\text{Yb}_{97}$