

Adopted Levels

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Shaofei Zhu	NDS 182, 2 (2022).	1-Apr-2022

S(n)=7300 SY; S(p)=1761 SY; Q( $\alpha$ )=7697 SY [2021Wa16](#)  
 $\Delta S(n)=540$ ;  $\Delta S(p)=375$ ,  $\Delta Q(\alpha)=200$  ([2021Wa16](#)).  
S(2N)=15996 (syst) 390, S(2P)=5498 (syst) 390, Q( $\epsilon p$ )=1628 (syst) 360 ([2021Wa16](#)).

 $^{236}\text{Bk}$  LevelsCross Reference (XREF) Flags

**A**  $^{240}\text{Es}$   $\alpha$  decay

E(level)	$J^\pi$	$T_{1/2}$	XREF	Comments
0	( $4^+, 6^-$ )	22 s +13-6	<b>A</b>	<p><math>\% \epsilon + \% \beta^+ \approx 83</math>; <math>\% \alpha \approx 17</math>; <math>\% \epsilon \text{SF} = 4</math> 2  <math>\% \epsilon, \% \alpha</math>: from <a href="#">2017Ko02</a> based on <math>^{240}\text{Es}</math> <math>\alpha</math> decay only correlated to <math>^{236}\text{Cm}</math> <math>\alpha</math> decay with no observation of <math>^{240}\text{Es}</math> and <math>^{236}\text{Bk}</math> <math>\alpha</math>-<math>\alpha</math> correlation, however, as pointed out in <a href="#">2020Po07</a>, events assigned as <math>^{213}\text{Rn}</math> <math>\alpha</math> decay in fig.4(c) of <a href="#">2017Ko02</a> could be <math>^{236}\text{Bk}</math> <math>\alpha</math> decay. As a result, <math>\% \alpha</math> and <math>\% \epsilon</math> are deduced by evaluator based on total 12 <math>^{240}\text{Es}</math> <math>\alpha</math>-decay events correlated with 10 <math>^{236}\text{Cm}</math> <math>\alpha</math>-decay events and 2 <math>^{236}\text{Bk}</math> <math>\alpha</math>-decay events.  <math>J^\pi</math>: from systematics with <math>\pi 3/2[521]</math> (<math>f_{7/2}</math>) and <math>\pi 7/2[633]</math> (<math>j_{15/2}</math>) orbitals expected to be near the proton Fermi surface for <math>Z=97</math> and <math>\nu 5/2[752]</math> (<math>j_{15/2}</math>) near the neutron Fermi surface for <math>N=139</math> resulting in two possible configurations <math>\pi 3/2[521] \otimes \nu 5/2[752]</math> or <math>\pi 7/2[633] \otimes \nu 5/2[752]</math> for the ground state. Tentative assignments of <math>K^\pi = 4^+</math> or <math>K^\pi = 6^-</math> based on the Gallagher-Moszkowski rule.  <math>T_{1/2}</math>: from ER-<math>\alpha</math>-fission(t) (<a href="#">2017Ko02</a>). Other: <math>\approx 19</math> s (<a href="#">2020Po07</a>, from two recoil-<math>\alpha</math> events).</p>
102 43	(1)		<b>A</b>	<p>E(level): from difference in energies of two <math>\alpha</math>'s from <math>^{240}\text{Es}</math>.  <math>J^\pi</math>: tentative assignments of <math>K^\pi = 1^+</math> or <math>K^\pi = 1^-</math> based on the Gallagher-Moszkowski rule for configurations <math>\pi 3/2[521] \otimes \nu 5/2[752]</math> or <math>\pi 7/2[633] \otimes \nu 5/2[752]</math>; or <math>K^\pi = 1^+</math> based on the <math>\alpha</math> decay with HF=2 from <math>^{240}\text{Es}</math> <math>K^\pi = (1^+)</math> g.s. state with configuration <math>\pi 7/2[633] \otimes \nu 5/2[633]</math> as proposed in the Adopted Levels of <math>^{240}\text{Es}</math>.</p>