

Muonic atom **1981Ho22,1979Ho23,1974Ba77**

Type	Author	History	Citation	Literature Cutoff Date
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Additional information 1.

1981Ho22 give experimental and calculated muonic x-ray transitions. Only the experimental values are given in the following table. Others: 1977Ho23 and 1977HoYL (same group as 1979Ho23,1981Ho22), 1974Wa2L (from the same group as 1974Ba77), 1968Ba36.

Muonic x-ray transitions (1981Ho22,1979Ho23)			
Transition		Energy (keV)	Intensity (relative)
$2^+, 2p_{1/2}$	– $0^+, 1s_{1/2}$	5579.0 7	13.9 15
$3^-, 2p_{3/2}$	– $3^-, 1s_{1/2}$		
and		5569.1 6	11.9 13
$0^+, 3d_{3/2}$	– $3^-, 1s_{1/2}$		
$2^+, 2p_{3/2}$	– $2^+, 1s_{1/2}$	5552.7 15	1.3 3
$0^+, 2p_{3/2}$	– $0^+, 1s_{1/2}$	5486.9 6	15.7 16
$2^+, 2p_{1/2}$	– $2^+, 1s_{1/2}$	5423.9 6	15.4 17
$0^+, 2p_{1/2}$	– $0^+, 1s_{1/2}$	5375.1 7	25 3
$0^+, 2p_{3/2}$	– $2^+, 1s_{1/2}$	5331.8 6	16.6 17
$0^+, 3d_{3/2}$	– $0^+, 2p_{1/2}$	2314.6 3	22.4 22
$0^+, 3d_{5/2}$	– $0^+, 2p_{3/2}$	2234.7 3	27 3
$0^+, 3d_{3/2}$	– $0^+, 2p_{3/2}$	2203.2 5	3.0 4
$0^+, 3d_{5/2}$	– $2^+, 2p_{1/2}$	2142.8 3	25 3
$0^+, 3d_{3/2}$	– $2^+, 2p_{1/2}$	2110.6 6	1.6 3
$0^+, 3p_{3/2}$	– $0^+, 2s_{1/2}$	1359.0 6	0.6 2
$0^+, 3p_{1/2}$	– $0^+, 2s_{1/2}$	1319.2 6	0.6 2
$0^+, 2s_{1/2}$	– $0^+, 2p_{1/2}$	1008.0 5	0.8 2
$0^+, 2s_{1/2}$	– $0^+, 2p_{3/2}$	895.9 3	0.4 1

 ^{188}Os Levels

E(level) [†]	J ^π [†]	Comments
0.0	0 ⁺	$\Delta\langle r^2 \rangle(^{188}\text{Os}, ^{186}\text{Os})=0.104 \text{ fm}^2$ 4 (1981Ho22). $\Delta\langle r^2 \rangle(^{190}\text{Os}, ^{188}\text{Os})=0.090 \text{ fm}^2$ 4 (1981Ho22).
155.02	2 ⁺	Q=–1.46 4 (1981Ho22,1977Ho23) B(E2) [†] =2.82 3 (1981Ho22,1977Ho23) Isomer shift=–0.15 keV 11 (1981Ho22).
477.94	4 ⁺	
633.02	2 ⁺	B(E2) [†] =0.30 15 (1981Ho22,1977Ho23) B(E2) [†] : from 2 ⁺ , 155. Isomer shift=1.38 keV 15 (1974Ba77).
789.98	3 ⁺	
2121.1? 2	(3 [–])	Q=1.69 9 (1979Ho23) B(E3) [†] =0.005 5 (1979Ho23) E(level): from 1979Ho23, includes isomer shift. Q: based on level energy uncorrected for isomer shift.

[†] From Adopted Levels.

Muonic atom **1981Ho22,1979Ho23,1974Ba77 (continued)** $\gamma(^{188}\text{Os})$

$E_\gamma^\dagger$	$I_\gamma^\ddagger$	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
154.61 3	33.5	155.02	2 ⁺	0.0	0 ⁺	E_γ : measured energy shift = -420 eV 40 (1974Ba77) and -400 eV 40 (1968Ba36). Calculated shift of -365 eV 45 gives isomer shift of -55 eV 55 (1974Ba77). $\Delta\langle r^2 \rangle / \langle r^2 \rangle = -8 \times 10^{-5}$ (1968Ba36).
479.49 12	3.3	633.02	2 ⁺	155.02	2 ⁺	
635.09 15	6.0	633.02	2 ⁺	0.0	0 ⁺	E_γ, I_γ : also 634.10 15 ($I_\gamma = 4.7$) reported with a different size detector.
636.83 17	5.7	789.98	3 ⁺	155.02	2 ⁺	E_γ, I_γ : also 636.20 9 ($I_\gamma = 7.4$) reported with a different size detector.
1643.1# 3		2121.1?	(3 ⁻)	477.94	4 ⁺	
1966.2# 2		2121.1?	(3 ⁻)	155.02	2 ⁺	

[†] Nuclear transition energy for muonic atom (1974Ba77). Value is shifted relative to the transition energy for an electronic atom.

[‡] In percent per stopped muons (1974Ba77).

From 1979Ho23. Uncorrected for isomer shift.

Muonic atom **1981Ho22,1979Ho23,1974Ba77****Level Scheme**

Intensities: Per 100 muons

Legend

- $I_\gamma < 2\% \times I_\gamma^{\max}$
→ $I_\gamma < 10\% \times I_\gamma^{\max}$
→ $I_\gamma > 10\% \times I_\gamma^{\max}$

