## Adopted Levels

History

| Type | Author | Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | M. S. Basunia[#], A. Chakraborty[##] | NDS 171, 1 (2021) | 1-Jun-2020 |

Q($\beta^-$)=11.34×10$^3$ *13*; S(n)=2.73×10$^3$ *13*; S(p)=2.443×10$^4$ *24*; Q($\alpha$)=−2.022×10$^4$ *16* 2017Wa10
Q($\beta^-$n)=3.76×10$^3$ *12* (2017Wa10).
S(2n)=9.58×10$^3$ *12*, S(2p)=45.6×10$^3$ *6 sys* (2017Wa10).
1970Ar09 − First production − $^{232}$Th($^{22}$Ne,X), E=174 MeV.
2000Oz01 − Measured production cross section 0.207 $\mu$b *64* for $^{23}$O from fragmentation of $^{40}$Ar on Be target, E ~1 GeV/nucleon.
2004St08: $^{9}$Be($^{36}$S,X),C($^{36}$S,X) E=77.5 MeV/nucleon. Recoil mass spectrometer, $BaF_2$ coincidence array. Produced 7500 and 19620 $^{23}$O nuclei using the Be and C targets, respectively. No gamma rays were observed in coincidence with $^{23}$O recoils suggesting that the first excited state lies above the neutron separation energy or below the detector threshold of 100 keV.
Other measurements: 2020Ta11 − proton knockout reaction $^{1}$H($^{25}$F,$^{23}$O), E=277 MeV/nucleon, cross section measured to be 81 $\mu$b *26*.

### $^{23}$O Levels

Cross Reference (XREF) Flags

| | | | |
|---|---|---|---|
| A | $^{1}$H($^{24}$O,$^{23}$O) | E | $^{9}$Be($^{26}$Ne,2pnX) |
| B | $^{2}$H($^{22}$O,p$^{23}$O) | F | C($^{24}$O,n$^{23}$O) |
| C | $^{9}$Be($^{24}$O,$^{23}$O) | G | C($^{23}$O,$^{22}$O),Pb($^{23}$O,$^{22}$O) |
| D | $^{9}$Be($^{26}$F,2n$^{22}$O) | H | $^{12}$C($^{24}$F,p$^{23}$O) |

| E(level) | J$^\pi$ | T or Γ | XREF | Comments |
|---|---|---|---|---|
| 0.0 | 1/2$^+$ | 97 ms *8* | ABCDEFGH | %$\beta^-$=100; %$\beta^-$n=7 *2*<br><r$^2$>$^{1/2}$($^{23}$N)=2.95 fm *23* (matter radius) (2011Ka36) using Fermi density and 2.97 fm *11* using harmonic oscillator density; deduced using Glauber model (2011Ka36). Also 3.20 fm *4* and 3.24 fm *27* in 2001Oz03.<br>J$^\pi$: L=0 from analysis of single neutron removal cross sections in ($^{23}$O,$^{22}$O).<br>Configuration: $\nu s_{1/2}$ (2007El02 − $^{2}$H($^{22}$O,P)).<br>T or Γ: From 2007Su05. Others: 82 ms *+45−28* (1990Mu06), 89 ms *76* (2008ReZZ, 1995ReZZ).<br>%$\beta^-$n: From 2007Su05. Others: 31 *7* (1990Mu06), 28 *30* (2008ReZZ, 1995ReZZ), and <29 (1991Re02). |
| 2.78×10$^3$† *13* | (5/2)$^+$ | <5 keV | A DE | %n≈100<br>E(level): From $^{1}$H($^{24}$O,$^{23}$O).<br>J$^\pi$: L=2 (longitudinal momentum distribution − $^{1}$H($^{24}$O,$^{23}$O)). Configuration: $\nu(0d_{5/2})^{-1}$ ($^{26}$Ne,2pnX) − (2007Sc32,2008Fr10).<br>Γ: From ($^{26}$Ne,2pnX) − 2008Ch07. Other: Γ=100 keV (2007Sc32 − ($^{26}$Ne,2pnx)) and (2011Ho05 − ($^{26}$F,2n$^{22}$O)) − value should be considered as upper limit − see comments in ($^{26}$Ne,2pnx). Same research group − 2007Sc32 and 2011Ho05. |
| 4000† *20* | (3/2)$^+$ | | B | Possible configuration: $\nu d_{3/2}$ (2007El02 − $^{2}$H($^{22}$O,p$^{23}$O)). |
| 5300† *40* | | | B | It is a state in fp shell. Possible configuration: $\nu p_{3/2}$ with S ≈ 1.0. Also a smaller probability for $\nu f_{7/2}$ with S ≈ 0.02. (2007El02 − $^{2}$H($^{22}$O,p$^{23}$O)). |

† Unbound state.