Adopted Levels:not observed

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 199,1 (2025)	30-Sep-2024

Q(β^-)=22350 *syst*; S(n)=−1060 *syst*; S(p)=27390 *calc*; Q(α)=−21690 *calc* 2021Wa16,2019Mo01
ΔQ(β^-)=750, ΔS(n)=780 (syst,2021Wa16).
Q(β^-) and S(n) from 2021Wa16. S(p) and Q(α) are theoretical values from 2019Mo01.
S(2n)=1190 *660*, Q(β^-n)=19420 *600* (syst,2021Wa16). S(2p)=51460 (2019Mo01, theory).
2002No11, 1997Sa14: ^{33}Ne not seen in reaction: Ta(^{48}Ca,X) E=64 MeV/nucleon. Reaction fragments analyzed by RIPS recoil fragment separator at RIKEN facility. Identification by measurements of energy loss, total kinetic energy, time-of-flight and magnetic rigidity for each fragment. Expected cross section for ^{33}Ne, based on measured cross sections for ^{31}F and ^{35}Na, is ≈10 pb. This cross section should result in the observation of some events for ^{33}Ne but none were seen.
2002Lu09, 2002Lu19: RIKEN-GANIL-Dubna collaboration. ^{33}Ne not seen in reaction: Ta(^{48}Ca,X) E=59.8 MeV/nucleon. Fragmentation of ^{48}Ca primary beam. Reaction fragments analyzed by RIPS recoil fragment separator at RIKEN facility and LISE-2000 spectrometer at GANIL. Isotopic Identification by measurements of energy loss, total kinetic energy, time-of-flight and magnetic rigidity for each fragment. No events were observed for ^{33}Ne.
2007Ba71: W(^{48}Ca,Xγ) E=141 MeV/nucleon beam from the National Superconducting Cyclotron Laboratory (NSCL). The fragments were separated with the A1900 fragment separator. Isotopic identification by multiple ΔE signals, magnetic rigidity, total energy and time of flight analysis. Detectors: plastic scintillators, parallel-plate avalanche counters (PPACs) and silicon PIN diodes. No events could be assigned to ^{33}Ne which confirmed this nucleus is unbound towards particle emission. The ^{34}Ne nuclide is observed in this work as bound nucleus. The ^{33}Ne nuclide should probably have been seen also if this were a bound nucleus.
Structure calculations:
2022Gu11: calculated single-particle levels.
2022Su17, 2021In02, 2008Wi11, 2005Ch71, 2004Ge02: calculated binding energies, deformation parameter.
2020Mi15: calculated energy of first 2^+ level and B(E2).
Additional information 1.

^{33}Ne Levels

E(level)	$T_{1/2}$	Comments
0?	<180 ns	%n=? ^{33}Ne g.s. is unbound towards neutron emission, according to non-observation of any events which could be assigned to ^{33}Ne in the experimental studies by 2007Ba71, 2002Lu09, and 2002No11 carried out at RIKEN, RIKEN-GANIL-Dubna collaboration, and NSCL-MSU. Most likely this nucleus is unbound towards one-neutron emission, as S(n) is −1060 keV *780* (syst), and S(2n)=1190 *660* (syst) (2021Wa16). J^π: predicted values: $3/2^-$ (theory, 2019Mo01), $7/2^-$ (syst, 2021Ko07). $T_{1/2}$: <180 ns estimated from time-of-flight in 2007Ba71. Theoretical $T_{1/2}$(β decay)=5.9 ms (2019Mo01), 5.7 ms (2021Mi17).