Adopted Levels

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 190,1 (2023)	20-Jun-2023

$Q(\beta^-)$=20310 *syst*; S(n)=2000 *syst*; S(p)=20510 *syst*; $Q(\alpha)$=−20140 *syst*   2021Wa16

Estimated uncertainties (2021Wa16): 400 for $Q(\beta^-)$, 500 for S(n), 570 for S(p), and 500 for $Q(\alpha)$.

S(2n)=6130 *410*, S(2p)=45460 *640*, $Q(\beta^-n)$=15230 *400* (syst,2021Wa16). $Q(\beta^-2n)$=12610 *400*, $Q(\beta^-3n)$=5910 *400*, $Q(\beta^-4n)$=1660 *400* deduced by evaluators from relevant mass excesses in 2021Wa16.

1989Gu03: ^{44}P first identified in ^{181}Ta(^{48}Ca,X) E=55 MeV/nucleon reaction followed by measurement of fragment spectra using LISE spectrometer at GANIL facility.

2004Gr20, 2003Gr22: Fragmentation of ^{48}Ca beam at 60 MeV/nucleon with Be target. The fragments were separated using LISE3 spectrometer at GANIL facility. The fragment identification by energy loss and time-of-flight measurements using Si detectors. Measured γ, ce using a Si(Li) detector and two Ge clover detectors.

2022Cr03: ^{44}P was produced in ^{9}Be(^{48}Ca,X),E(^{48}Ca)=172.3 MeV/nucleon at the FRIB, MSU, followed by separation of fragments of interest using Advanced Rare Isotope Separator (ARIS), and delivered to the FRIB Decay Station initiator (FDSi) consisting of fast-response YSO (yttrium orthosilicate, Y_2SiO_5) scintillator implantation detector, 11 HPGe clover detectors, 15 fast-timing LaBr$_3$ detectors, and 88 neutron detectors of the VANDLE array. Deduced particle identification plot of Z versus A/Q. Measured $T_{1/2}$ of ^{44}P decay from (implants)β-correlated decay curve.

2022Tr03: ^{44}P produced in ^{9}Be(^{48}Ca,X),E(^{48}Ca)=140 MeV/nucleon, and reaction products separated by A1900 fragment separator at the NSCL-MSU facility. Selected isotopes were transported to the Beta Counting System (BCS) consisting of Double-Sided Silicon Strip Detector (DSSD), two Si PIN detectors, and 16 Clover HPGe detectors. Measured half-life of the decay of ^{44}P, %β^-n for the decay of ^{44}P by following the decay chain of ^{44}P through β^- and β^-n decay daughters, Eγ.

Mass measurement: 2007Ju03.

2010Ga15: theory: calculated levels, J^π using shell model.

Theoretical calculations: two references for radioactive decays retrieved from the NSR database (www.nndc.bnl.gov/nsr/) are listed in document records which can be accessed via web-based ENSDF database.

Additional information 1.

^{44}P Levels

E(level)	$T_{1/2}$	Comments
0	18.2 ms *10*	%β^-=100; %β^-n=75 *8* (2022Tr03); %β^-2n=?; %β^-3n=?; %β^-4n=?
		$T_{1/2}$: from time correlations between β rays and fragment implants in all the three studies; the adopted $T_{1/2}$ is weighted average of 18.8 ms *17* (2022Cr03, statistical uncertainty of 0.8 ms and systematic uncertainty of 1.5 ms added in quadrature); 18 ms *1* (2022Tr03); 18.5 ms *25* (2004Gr20,2003Gr22).
		%β^-n from β, γ data (2022Tr03), by following the decay chain of ^{44}P through β^- and β^-n decay daughters,
		Theoretical $T_{1/2}$=14 ms, %β^-n=55, %β^-2n=21, %β^-3n=0 (2019Mo01).
		Theoretical $T_{1/2}$=53 ms, %β^-n=17.3, 17.7; %β^-2n=18.6, 23.5; %β^-3n=0.047, 0.11; %β^-4n=0 (2021Mi17); two values for different fission barriers.