^{132}Sn(d,p) 2010Jo03

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yu. Khazov and A. Rodionov, F. G. Kondev	NDS 112, 855 (2011)	31-Oct-2010

2010Jo03,2007Jo09: ^{2}H(^{132}Sn,p); measured E(p), I(p), angular distributions of protons; deduced levels, J^{π}, inverse kinematics; ORNL Holifield Radioactive Ion Beam Facility, ^{132}Sn-beam with E=630 MeV from proton-induced fission of ^{238}U, thin foil deuterated polyethylene CD_2 target; 20 individual Si detectors, Si detector array SIDAR, six position sensitive ORRUBA detectors, ΔE/E telescopes, microchannel plate detector. Single-neutron states measured in ^{133}Sn and through the single-particle content of these states, doubly-magic character of ^{132}Sn nuclide is explored. DWBA analysis of $\sigma(\theta)$ data using local and global optical potential parameters. Comparison with data for low-lying single-particle states in ^{209}Pb from ^{208}Pb(d,p) reaction. Cross section data are from supplementary material in the online version of the 2010Jo03 article.

^{133}Sn Levels

There is no evidence for the population of a $9/2^-$ (from $h_{9/2}$ orbital) level at 1561 keV.

E(level)	J^{π}[†]	L	S[@]	Comments
0	$7/2^-$	3	0.86 *16*	J^{π}: $\sigma(\theta)$ pattern fits $2f_{7/2}$ better than $3p_{3/2}$. configuration: proposed $\nu(f^{+1}_{7/2})$. Asymptotic normalization coefficient C^2=0.64 fm^{-1} *10*. $d\sigma/d\Omega$ (mb/sr)=4.3 *7* at 28.8°, 6.9 *8* at 31.7°, 6.3 *7* at 34.7°, 8.2 *9* at 37.6°, 6.9 *11* at 42.1°, 9.3 *15* at 47.5°, 8.8 *15* at 54.5°, 8.8 *13* at 59.8°, 8.4 *9* at 64.1° (all angles in c.m. system).
853.7[‡] *3*	$3/2^-$	1	0.92 *18*	J^{π}: $\sigma(\theta)$ pattern fits $3p_{3/2}$ better than $2f_{7/2}$. configuration: proposed $\nu(p^{+1}_{3/2})$. Asymptotic normalization coefficient C^2=5.6 fm^{-1} *9*. $d\sigma/d\Omega$ (mb/sr)=11.5 *12* at 26.4°, 11.7 *11* at 29.1°, 13.1 *11* at 32.1°, 16.5 *17* at 43.8°, 15.1 *15* at 50.2°, 11.9 *13* at 61.6° (all angles in c.m. system).
1363[#] *31*	$(1/2^-)$		1.1 *3*	configuration: proposed $\nu(p^{+1}_{1/2})$. Asymptotic normalization coefficient C^2=2.6 fm^{-1} *4*. $d\sigma/d\Omega$=8.7 mb/sr *17*, integrated σ for 33.3°−54.0° (c.m.).
2004.6[‡#]	$(5/2^-)$		1.1 *2*	configuration: proposed $\nu(f^{+1}_{5/2})$. Asymptotic normalization coefficient C^2=(0.0009 fm^{-1} *2*). $d\sigma/d\Omega$=11.3 mb/sr *19*, integrated σ for 48.4°−54.7° (c.m.).

[†] From comparison of measured angular distributions with DWBA calculations for L=1 and 3 using FRESCO code with local (Stromich) and global (Lohr-Haeberli for deuteron incoming wave and Chaperl-Hill89 for outgoing protons) optical model parameters.
[‡] From Adopted Levels.
[#] Detailed angular distribution measurements were not possible.
[@] Relative quoted uncertainties include statistical and systematic.