

C(^{31}Ne , ^{30}Ne) 2014Na10

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh		NDS 184, 29 (2022)	24-Jun-2022

Includes Pb(^{31}Ne , $^{30}\text{Ne}\gamma$).

[2014Na10](#), [2012Ta02](#), [2009Na39](#): ^{31}Ne beam was produced by fragmentation of 345 MeV/nucleon ^{48}Ca primary beam on a Be target at the RIKEN Nishina Center and the Center for Nuclear Study, University of Tokyo. Fragments were separated by BigRips separator and the secondary beam of ^{31}Ne was incident on Pb (thickness 3.37 g/cm²) and C (thickness 2.54 g/cm²) targets with mean energies of 234- and 230-MeV/nucleon (mid target), respectively, at the entrance of ZeroDegree Spectrometer (ZDS). Outgoing ^{30}Ne fragments were identified by ZDS and also used to extract momentum distribution of the ^{30}Ne residues, γ rays in coincident with ^{30}Ne were detected by DALI2 γ -ray detector array, consists of 182 NaI(Tl) scintillator crystals. Deduced inclusive and γ -ray tagged partial cross sections for one-neutron removal from ^{31}Ne on C and Pb targets, S(n), and g.s. J^π . S(n) value for ^{31}Ne was estimated as 0.15 MeV +16-10 using deduced spectroscopic factors C²S from the $^{30}\text{Ne}(0^+)$ partial cross section on the C target and Coulomb breakup on the Pb target as a function of the assumed S(n) and J^π of ^{31}Ne ([2014Na10](#)).

 ^{31}Ne Levels

E(level)	J^π	Comments
0	$3/2^-$	<p>J^π: from comparisons of measured inclusive and partial one-neutron removal cross sections, inclusive parallel momentum distribution of ^{30}Ne residues with eikonal-model predictions using C²S value noted below. From consistency of the measured data with the shell model calculations, ^{31}Ne is identified as deformed and having a significant p-wave halo component.</p> <p>C²S (0_1^+; $2p_{3/2}$)=0.32 +21-17, obtained from shell model calculations considering SDPF-M interactions (2014Na10).</p> <p>Interaction σ=1435 mb 22 (2012Ta02). Glauber-type analysis of data and interpretation in terms of low (L=0 or 1) orbital halo structure in ^{31}Ne.</p> <p>In-removal σ=90 mb 7 (2014Na10), 79 mb 7 (2009Na39) on a carbon target; 720 mb 61 (2014Na10), 712 mb 65 (2009Na39), on a Pb target.</p>