$^{1}H(^{19}C,18\varepsilon N)$ 2008Sa03

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. H. Kelley, G. C. Sheu	ENSDF	23-March-2017

2008Sa03:
Beam=^{19}C, target=liquid hydrogen.

A E=70 MeV/nucleon ^{19}C beam was produced at the RIKEN/RIPS facility by fragmenting a 110 MeV/nucleon ^{22}Ne in a thick target. The beam impinged on a 3 cm diameter cryogenic hydrogen target with 120 mg/cm^2 areal density. The γ-rays from reactions in the target were detected using 48 NaI(Tl) scintillators while charged particles were detected with a plastic counter hodoscope. Neutrons, from ^{19}C breakup, were detected using a neutron hodoscope consisting of two walls of plastic scintillator array.

The inclusive ^{18}C+n and exclusive ^{18}C+n+γ[^{18}C*(2$^+$)=1.58 MeV] spectra were analyzed. A resonance at E(rel)=0.88 MeV *1* with Γ=290 keV *20* was observed in the inclusive spectrum, but absent in the exclusive γ-ray coincidence events; evidence the state decays to $^{18}C_{g.s.}$. In addition, the angular distribution of the resonance was analyzed and compared with DWBA calculations.

See analysis in (2016La20), which suggests strong dynamic excitation of the ^{18}C core is required to find agreement in σ magnitude for the J^π=5/2$^+$ ($E_x\approx$1.46 MeV) state. See also (2011Cr02).

2011Oz01: The cross section for 1-n removal from 40 MeV/nucleon ^{19}C on protons in a liquid hydrogen target (204 mg/cm^2) was measured at the RIKEN/RIPS facility along with the parallel momentum distribution of ^{18}C fragments. In addition, the 160 NaI(Tl) element DALI2 array surrounded the reaction target and measured deexcitation γ-rays correlated with breakup fragments. The cross section σ_{1n}=101 mb *11* is measured along with a ^{18}C fragment parallel momentum distribution width of FWHM=83 MeV/c *12*.

^{19}C Levels

E(level)[†]	J$^\pi$	Γ (MeV)	σ (mb)[#]	Comments
0	1/2$^+$			
1.46×10^3 *10*	5/2$^+$[‡]	0.29 MeV *2*	8.6 *4*	Resonance energy(c.m.)=880 keV *10* (g.s. in ^{18}C). J$^\pi$: from DWBA analysis of angular distribution.

[†] Excitation energy=resonance energy+S(n)+excitation energy of the daughter nucleus ^{18}C.
[‡] From comparison of $\sigma(\theta)$ distributions with DWBA calculations for ^{19}C(p,p′) reaction.
[#] Experimental cross-sections.