^{20}Ne(n,n),(n,γ):res 2014He25

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	R. B. Firestone	NDS 127, 1 (2015)	15-Jan-2015

99.8% enriched ^{20}Ne gas target in stainless steel cylinder at 150 atmospheric pressure. Neutrons were produced from ^{7}Li(p,n)^{7}Be reaction with a pulsed proton beams of 1.0 ns width and a variable repetition rate of 1 MHz and 250 MHz for the capture and transmission runs. E=5 to 800 keV. Neutrons were detected using two C_6D_6 liquid scintillation detectors, neutron energy resolution was 0.2 and 1.5 keV at 20 and 200 keV, respectively. Neutron capture events were detected using the C_6D_6 detectors in combination with the pulse height weighting technique. The resonances in the capture cross sections were identified and analyzed using the multilevel R-matrix code SUMMY. Deduced Maxwellian-averaged cross sections (MACS) for steller (n,γ) from 5 to 100 kT (keV). At kT=30 keV thermal energy, MACS value is 240 μb *29* for ^{20}Ne.

^{21}Ne Levels

E(level)[†]	J$^{\pi}$[‡]	L[‡]	Comments
6901.48 *16*	1/2$^-$	1	Γ_γ=3.7 eV *2*; Γ_n=861 eV *29* Resonance energy (lab)=147.40 keV *15*. g=(2J(res)+1)/((2I$_n$+1)(2I(^{20}Ne$_{g.s.}$)+1))=1; not 1/3 as listed in Table II of 2014He25. The strength of this resonance is 80% larger than that reported by 1988Wi14.
7211.1 *5*	1/2$^+$	0	Γ_n=107.8 keV *11* Resonance energy (lab)=472.6 keV *5*. g=(2J(res)+1)/((2I$_n$+1)(2I(^{20}Ne$_{g.s.}$)+1))=1.

[†] From S$_n$(^{21}Ne)=6761.16 *4* (2012Wa38)+En(c.m. system).
[‡] From capture cross section fittings using the multilevel R-matrix code SAMMY.