

${}^{208}\text{Pb}({}^{20}\text{N}, {}^{20}\text{N}\gamma): \text{coulex}$ 2016Ro13

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. G. Sheu, J. H. Kelley	ENSDF	31-Dec-2018

2016Ro13: The Coulomb dissociation cross section of ${}^{20}\text{N}$ was studied at the GSI LAND/R3B facility using a secondary beam produced by fragmenting an 490 MeV/nucleon ${}^{40}\text{Ar}$ beam. The ${}^{20}\text{N}$ beam impinged on a 0.176 mm 4 thick natural lead target for the Coulomb Excitation measurements, while measurements on a 5.08 mm thick carbon target were used to estimate the nuclear breakup contributions. Reaction γ -rays were detected using the 162 NaI Crystal Ball array; neutrons from Coulomb breakup reactions were detected in the LAND neutron wall array, and the core ejectiles were deflected in the ALADIN magnet and detected and identified in a two-dimension position sensitive plastic scintillator ΔE wall.

The ${}^{20}\text{N}$ excitation energies were determined via the invariant mass method by analyzing the momenta of the neutron and ${}^{19}\text{N}$ residual and then adding the γ -ray energy. The excitation spectrum, based on the dissociation reactions, begins around the neutron breakup threshold (≈ 1.8 MeV) and then shows several structures between $E_x=5$ to 14 MeV, that are associated with excited states. Additional structures are observed above $E_x \approx 14$ MeV, but they may be consistent with background. Coincidences with the decay γ rays from the ${}^{19}\text{N}^*(1141 \text{ keV})$ first excited state were also analyzed. The experimental resolution is not discussed.

 ${}^{20}\text{N}$ LevelsE(level)[†]

0
 3500?[‡]
 4600?
 5500[‡]
 7000[‡]
 9000[‡]
 10200
 11500

[†] From Coulomb dissociation to ${}^{19}\text{N}_{\text{g.s.}}$

[‡] Also observed in decays to ${}^{19}\text{N}^*(1141 \text{ keV})$.

 $\gamma({}^{20}\text{N})$

<u>E_γ</u>	<u>$E_i(\text{level})$</u>	<u>E_f</u>
3500	3500?	0
4600	4600?	0
5500	5500	0
7000	7000	0
9000	9000	0
10200	10200	0
11500	11500	0

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Level Scheme

