

PHOTONUCLEAR CROSS SECTIONS IN ^{11}B

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In order to evaluate the cross sections for reactions, leading to different states of the residual nuclei in the photoneuclear reaction on ^{11}B , two experiments with irradiation of natural boron target and an enriched target (98,5 % ^{11}B) were performed. The targets were irradiated with bremsstrahlung spectra with different end-point energies in the energy region between 15 and 31 MeV. Gamma rays, emerging from the natural-boron target were detected with a Ge(Li) detector. From the yields in the deexcitation lines, cross sections for transitions to the second, third and seventh excited state in the $^{11}\text{B}(\gamma, n)$ reaction were deduced. Photoprotons from the enriched target were detected at four different angles with respect to the direction of the bremsstrahlung beam. From the spectra, the cross sections for the population of the ground and first excited state in ^{10}Be , which are analogs of the second and seventh excited state in ^{10}B , were derived. In addition, the cross sections for the reactions, leading to groups of excited states at 6, 9.5 and 10.5 MeV were calculated.

To derive the isospin composition of the giant dipole resonance, one has to compare the energy dependence of cross sections for the decay of the GDR in analog residual states. The shapes of the cross sections, leading to the seventh excited state in ^{10}B and the first excited state in ^{10}Be imply only a moderate splitting.

The total cross section for absorption of gamma rays was obtained from the total $^{11}\text{B}(\gamma, p)$ cross section and the total $^{11}\text{B}(\gamma, n)$ cross section from ref. 1. The integrated cross section exhausts 95 % of the TRK sum rule.

Ref.1 U.Kneissl et al, Nucl. Phys. 264A (1976) 31