RECENT DEVELOPMENT IN THE STUDY OF THE RADIATIVE CAPTURE OF NEUTRONS IN THE REGION OF GIANT DIPOLE RESONANCE

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On the basis of the systematic study of the integrals of prompt γ-spectra from the radiative capture of 14 MeV neutrons the much higher (factor of 10) cross sections, obrained by the use of the activation technique, have been put in question [1-3]. Very recently the activation technique was improved and the new data agree with those obtained from the prompt γ-ray spectra measurements within the experimental error [4].

First measurements of the excitation functions for the neutron capture to different final states have been reported [5]. Broad resonances of the width of giant dipole resonance have been observed. The agreement with the prediction of the residual interaction function is supposed to be real. Agreement is improved very much if this function is taken to be complex [6].

In addition to that we have refined the semidirect capture model to calculate the angular distribution of capture γ-rays.

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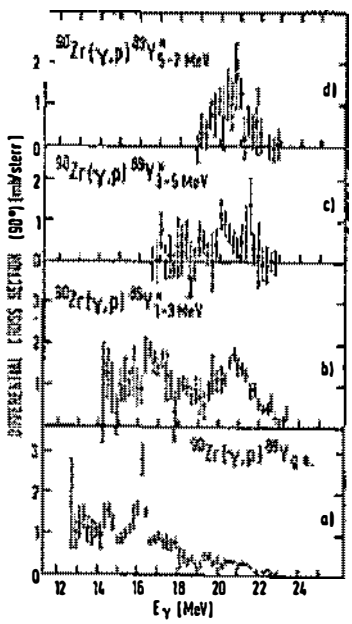

In contrast to the (γp_0) reaction, the cross section for the transition to the group of residual states from 1-3 MeV excitation energy in ^{89}Y (mean energy 1.8 MeV) shows two broad resonances centred around 16 and 21 MeV. They could be interpreted as T < (=5) and the T > (=6) of the giant resonance (ref. 1 and ref. cited there).

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The Effective g_s Factor for the Odd Proton Eu^{153} Nucleus Determined by the Internal Conversion Processes

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The K/L_3, L_1/L_3, L_1/L_2 and L_2/L_3 conversion ratios for the 103 KeV transition in Eu^{153} were measured by means of a high-resolution $\pi\sqrt{2}$ electron spectrometer. The values of the M1 conversion penetration parametar $\lambda=5.0^{+0.6}_{-0.7}$ and the mixing ratio $\delta^e=0.144\pm 0.006$ are deduced. By comparing the experimental penetration parameter with the value obtained from Nilsson model calculations the effective spin gyromagnetic ratio is found to be

$$g_s^{eff} = (3.7^{+0.4}_{-0.5})\ \mu_n.$$