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III-6 Magnetic Moment and Half Life of the 215-keV, 3⁺ State in ⁷²As

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With the reaction 72 Ge(p, n) 72 As the lower part of the 72 As energy spectrum was investigated and a new isomeric level at 215 keV was found. In Fig. 1 the level scheme is shown which was constructed from excitation function, coincidence and neutron time-of-flight measurements. The 215-keV state decays to the ground state via a direct transition and a 169-46-keV γ -cascade. The half life of the level was measured as

$$T_{1/2} = 80(2)$$
 ns.

With the DPAD method the *g*-factor of the 215-keV isomeric state was determined by observing the 215-keV and 169-keV transitions. The result is

$$g = +0.525(6).$$

Different signs and the amplitude ratio of the A_2 terms of the 215-keV and 169-keV γ -lines displayed in the spinrotation pattern, suggest a multipole assign-



Fig. 1. Neutron time-of-flight spectrum and level scheme of ⁷²As.



Fig. 2. Modulation of the γ -ray intensity of the 215-keV and 169-keV transitions; $B_{ext.} = 27$ kOe.

ment of E1 and E2, respectively (Fig. 2). Additionally Weisskopfestimates for the γ -transitions and a Hauser-Feshbach analysis of the intensity ratio of the neutron lines lead to a spin and parity assignment of $I^{\pi} = 3^+$ of the isomeric state. Comparing the measured magnetic moment with values derived from experimental *g*-factors of the neighbouring nuclei in the *jj*-coupling model best agreement is obtained for the configurations

$$[\pi(2p_{3/2})^{-1}\nu(2p_{3/2})^{-1}]_{3^+}$$
 and $[\pi(1f_{5/2})^1\nu(2p_{1/2})^1]_{3^+}$.