GYROMAGNETIC FACTOR OF THE $9^+$, 3034 keV STATE IN $^{66}$Ga

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The g-factor of the $9^+$, 3034 keV state in $^{66}$Ga has been found to be $g = 0.47 \pm 0.10$ by means of the integral perturbed angular distribution in an implanted source. The excited states were populated by the reaction $^{56}$Fe$(^{12}$C, pn)$^{66}$Ga at $E_C = 45$ MeV.

1. Introduction

Excited states in the odd-odd $^{66}$Ga nucleus have been studied using both the $^{66}$Ge disintegration [1-3] and nuclear reactions [4-6]. Morand et al. [6], using the $^{64}$Zn($\alpha$, pn)$^{66}$Ga reaction, have presented a level scheme of $^{66}$Ga up to 5109 keV in excitation and spins up to 13.

In the present paper, the g-factor of the $9^+$, 3034 keV state in $^{66}$Ga was measured.

2. Experimental procedure and results

The g($9^+$, 3034 keV, $^{66}$Ga) factor was measured by observing the integral rotation of the angular distribution pattern by the Larmor precession of the nuclei in the internal field of a magnetized ferromagnetic medium.

For the production of $^{66}$Ga in high excited states, the most useful reaction proved to be $^{56}$Fe$(^{12}$C, pn)$^{66}$Ga since (i) after the nuclear reaction, the residual excited gallium nucleus is implanted in iron, and (ii) the (2pn) exit channel, being an important competing process, the resulting $^{65}$Zn was used for the verification of the experimental method. Indeed, the well-known value of the g-factor of the $9/2^+$, 1066 keV state in $^{65}$Zn [7] can be compared with the value measured simultaneously in this work.
Fig. 1. Rotation of the angular distribution pattern for 201 (a) and 390 (b) keV transitions deexciting $9/2^+$, 1066 keV and $9^+$, 3034 keV states in $^{64}$Zn and $^{66}$Ga, respectively. The curves are computer fits to the experimental points.