

NUCLEAR REACTION $^{41}\text{K}(\alpha, n)^{44m}\text{Sc}$ AND ISOMERIC CROSS SECTION RATIOS

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The calculations of the excitation functions of high-spin and low-spin isomeric states production in one and the same nucleus as well as the respective isomeric cross section ratios (ICSR) were carried out for reaction $^{41}\text{K}(\alpha, n)^{44m}\text{Sc}$. Measurements of ICSR allow one to obtain reliable information on angular momentum dynamics of a preceding reaction and spin dependence of nuclear level density. This dynamics depends on the properties of a target, projectile and emitted particles. Experimental studies of ICSR produced by reaction $^{41}\text{K}(\alpha, n)^{44m}\text{Sc}$ in the α -particle energy ranges 14–32 MeV were carried out by us earlier using off-beam measurements of induced activity of members of the isomeric pair. Calculations of ICSR for the indicated reaction are performed using the codes EMPIRE-3 and TALYS. For the discussed conditions the values of ICSR calculated by EMPIRE-3 are in disagreement with experimental ones being 20-30 % greater. At higher energies of α -particles calculated values of isomeric ratios significantly exceed experimental ones. As for the data obtained by use of TALYS code they turn to be in a good agreement with experimental ones over all measured region except the expressive experimental maximum of ICSR at energy 26 MeV.