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Isomeric RIB Production of Aluminum-26

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26mathrmAl is known as the first specific radioactivity detected via characteristic beta-delayed gamma-ray by astronomical telescopes.
Despite a lot of effort over the past three decades, the particular production sites of galactic 26Al are not well understood and there is a discrepancy between observations and theories on estimated abundance of 26mathrmAl in the interstellar medium.
Its isomer, 26Al, which is $Jpi=0+ and has a short lifetime of 6.35~s compared with the ground state, 26gAl, which is Jpi=5+ and T_{1/2}=0.72~Myr, may play an important role to the problem because it falls to 26Mg as super allowed Fermi transition and does not emit any gamma-rays.
The two states, 26g,Al, are suggested to be in transition and in thermal equilibrium by thermal photons via low-lying 1+ state, at least in extremely high temperature environments, such as a supernova.
However the experimental information on the isomer is poorly examined and thus was requested for further experimental study by stellar modelers.
The RI beam production of 26mAl is a step to approach the puzzles of the abundance under the equilibrium.
We will present an overview of the experiment to produce the isomeric RI beam of 2Al and measure proton elastic resonant scattering with a thick target in inverse kinematics by using the Center for Nuclear Study low-energy radioactive ion beam separator (CRIB), located at RIKEN Nishina Center.

Summary

We performed an experiment with regard to the puzzle of Al-26. The mixed isomeric RI beam of Al-26 was produced by CRIB and used for measurement of proton elastic scattering. The resonance of (p,g) reaction might play an important role in the thermal equilibration. The detail and the result of the experiment will be presented.

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