

Neutron-capture elements in open clusters

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Elements beyond Fe are produced through the process of neutron capture. The s-process is known to occur in a low-mass star as it evolves to an asymptotic giant branch (AGB) star. On the other hand, the r-process is believed to occur in a neutron star merger (NSM). Kolborg et al. (2023) carried out a numerical simulation of the spatial distribution of the r-process element (Eu), and they revealed the inhomogeneous distribution of Eu with a scale of 100 pc. Research into the chemical components of open clusters plays a critical role in investigating recent chemical evolution of Solar neighborhood. According to simulation, NSMs occur one time per 300 Myr in 100 pc³, so that we expect different abundances of the r-process elements between clusters that have a distance of more than 100 pc, and also clusters that the age difference is more than 300 Myr. We have investigated the abundance of neutron-capture elements (Y, Zr, Ba, La, Ce, Pr, Nd, Sm, Eu, and Gd) in the Pleiades and the Hyades. Archival data of HIRES on the Keck Telescope were used. We derived the stellar parameters (effective temperature, surface gravity, microturbulent velocity, and [Fe/H]), then we measured 1-4 lines for each element. We compared the abundance between the Pleiades and the Hyades. It was found that the abundances of neutron-capture elements in two clusters are almost the same.

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