

# NITROGEN ABUNDANCE IN OXYGEN-RICH GIANTS THROUGH K TO LATE M

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Nitrogen abundances in red giants are important to understand the contribution of low-mass and intermediate-mass stars to the chemical enrichment of the Galaxy. Nitrogen abundances in 23 oxygen-rich cool evolved stars are derived by the analyses of high resolution infrared spectra including CN lines (red systems) in the *K*- and *H*-window regions as well as NH lines in the *L*-window region (Aoki W. & Tsuji T. 1997, *A&A*, in press). Our sample includes 2 K giants, 20 M giants and 1 S-type star.

The result shows that the nitrogen abundances in late M giants are larger than those in early M giants while decrease of the carbon abundance was found in late M giants by our previous work (Tsuji T., 1991, *A&A* 245, 203). The average abundances in early and late M giants are shown in the table ( $\log A_{\text{H}}=12$ ). These variations of abundances can not be explained by the first dredge-up model but require additional processing by the CN cycle and mixing after the first dredge-up. However, there is no obvious evidence of other processes such as the  $3\alpha$ -process and subsequent hot bottom burning in our program stars. Such variation of the abundances is not well understood by the present evolutionary models of low-mass and intermediate-mass stars.

spectral type	number of objects	$\log A_{\text{C}}$	$\log A_{\text{N}}$
early M giants (K5-M3.5)	11	8.37	8.11
late M giants (M4-)	8	8.10	8.45

Nitrogen would be produced in massive stars which evolve to supernovae as well as in low-mass and intermediate-mass stars by the CNO cycle, but their contributions to the chemical evolution of the Galaxy are not resolved quantitatively. Our result which shows high nitrogen abundance in late M giants is one of the bases to understand the origin of nitrogen.