ANALYSIS OF THE PARAMETERS AND ABUNDANCE OF N-CAPTURE ELEMENTS FOR FOUR STARS WITH DIFFERENT METALLICITY

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ABSTRACT. Based on the spectra obtained with echelle spectrograph SOPHIE (1.93 m telescope, OHP, France) and the selection of lines (Basak & Mishenina, 2012). we have redefined the parameters and have determined the abundances of the elements produced in the process of neutron captures for stars HD 6582, HD19445, HD 84937, HD170153. Obtained abundance of Y, Zr, La, Ce, P, Nd, Sm, and Gd,shows the solar scaled abundance distribution.

Key words: Stars: abundance – Stars: late-type

To analyze the stars in a wide range of metallicity (-3 ≤ [Fe/H] ≤ -0.7) based on the spectra obtained with high resolution and signal to noise ratio (S/N) allow us to precise the sources of its production at different metallicities.

The spectra for the four stars were selected from the archives of the spectrograph SOPHIE (Perruchot et al. 2008) at 1.93 m telescope (OHP, France) (http://www.obs-hp.fr/www/guide/sophie/sophie-info.html. Processing of the spectra was performed using the new version of the DECH20 software by Galazutdinov (1992).

In this work we have redefined the parameters four four stars HD 6582, HD19445, HD 84937, HD170153and focused our attention on the elements produced in the process of neutron captures. The effective temperature $\mathbf{T_{eff}}$ were redefined upon the independence of iron abundance, obtained with the lines of Fe I, from the potential of the lower level of the line. The gravity log g was determined using ionization balance for Fe I and Fe II. The microturbulent velocities ξ were determined using the independence of the iron abundance on the individual equivalent width of Fe I lines. T he main parameters of the stars are in Tabl. 1.

Table 1. Parameters of studied stars

HD	V	Sp	T_{eff} (K)	log *g*	ξ (km s^{-1})	[Fe/H]
6582	5.1	G5Vb	5330	4.35	0.4	-0.86
19445	8.1	A4p	5950	4.1	1.3	-1.99
84937	8.3	sdF5	6200	3.8	1.6	-2.15
170153	3.6	F7V	6160	4.0	0.9	-0.57

To determine the abundance we used the Kurucz's models and the line list (Basak & Mishenina, 2012). The atomic parameters of this line list were taken from the database VALD (Kupka et al., 1999), for Ce II lines from Lawer et al. 2009. The Fe, Y, Zr, La, Ce, Pr, Nd, Sm, and GdII abundances in the atmospheres of studied stars were computed under the WIDTH program by Kurucz (1993).

The results are given at Fig.1. As solar abundance we used the data from Grevess et al (2010).

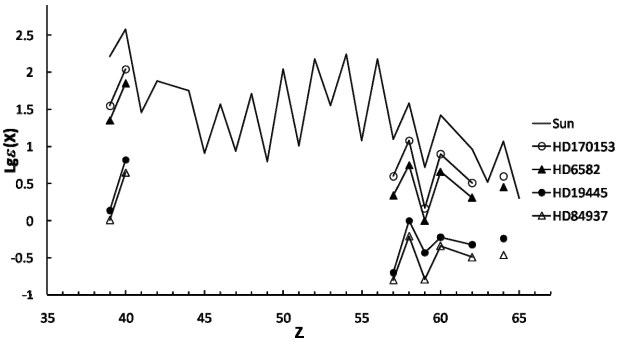

Fig. 1. Behaviour of the element abundances in the atmospheres of the Sun and of investigated stars.

Results and conclusions

1. We determined the abundance of Fe (using from 475 to 876 lines), Y (from 11 to 23), Zr (from 9 to 23), La (from7 to 25), Ce (from5 to 57), Pr (from4 to 22), Nd (from 11 to 73), Sm (from 5 to 46), and Gd (from 1 to 12).

2. We found that distribution of n-capture element's abundance in studied stars are corresponding to solar scaled abundance distribution. This suggests that the sources of enrichment by these elements with pre-stellar medium are the same as for the Sun.

Acknowledgments. This work was supported by the Swiss National Science Foundation (SCOPES project No.~IZ73Z0-128180/1).

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