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# Spectroscopic features of an evolved hot chemically peculiar star: HR 62 (B8 III)

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## Abstract

*Context.* The spectrum of the evolved B8 III star HR 62 exhibits weak He-lines as well as strong Mn and P lines. The star therefore resembles both CP3 (HgMn) and CP4 (He-weak PGa) type stars.

*Aims.* We have analysed the spectrum of the star to derive its chemical abundances. We have also used theoretical surface gravity - effective temperature diagram to clarify its evolutionary status and estimate its mass and age. As a comparison star, we have also analysed the dwarf HR 677 (B8 V) which has the similar effective temperature and projected rotational velocity with those of HR 62.

*Methods.* The medium resolution ( $R \sim 14000$ ) spectra covering the wavelength range of 4380-7350 Å of the late B-type stars HR 62 and HR 677 have been obtained from the Shelyak eShel Spectrograph attached to the 40 cm telescope in Ankara University Kreiken Observatory (AUKR), Turkey. The atmospheric parameters of the stars have been derived by using the photometric measurements in Johnson filters and the Balmer line profiles in the spectra. The abundances have been derived by iteratively adjusting the parameters of synthetic spectra and modelling the selected unblended lines of the elements. For the spectrum synthesis, we used SYNSPEC49 code and its SYNPLLOT interface written by I. Hubeny and T. Lanz.

*Results.* We have found that the atmosphere of HR 62 exhibited slight underabundance of He and Mg, underabundance of Si, slight overabundance of Ne, and overabundance of P and Mn, with respect to the Sun. HR 677, on the contrary, has no any remarkable chemical peculiarities. The mass of 5.4 (solar unit) and age of  $8.9E+07$  yr. have been estimated of HR 62.

*Discussion.* We have discussed the origin of the chemical peculiarities of HR 62 and its probable peculiarity class. The effective temperature of the star (12500 K) agrees well with those of HgMn stars. Furthermore, the main sequence end of its evolutionary track also intersects the domain of He-weak PGa stars. These initial results thus suggest that the star can be a transition object between CP3 and CP4 types. However, a more detailed analysis with a higher resolution spectrum including bluer regions ( $< 4380$  Å) is needed for a clear conclusion.

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