*Revista Mexicana de Astronomía y Astrofísica*, **47**, 219–234 (2011)

# UPPER MAIN SEQUENCE STARS WITH ANOMALOUS ABUNDANCES. THE HGMN STARS HR 3273, HR 8118, HR 8567 AND HR 8937

C. Saffe, N. Núñez, and H. Levato

Instituto de Ciencias Astronómicas, de la Tierra y del Espacio (ICATE)
and Facultad de Ciencias Exactas, Físicas y Naturales
Universidad Nacional de San Juan, Argentina

*Received 2010 December 13; accepted 2011 April 14*

RESUMEN

Este trabajo es parte de un estudio para verificar posibles tendencias de las abundancias en estrellas HgMn con los parámetros estelares, rotación y edad. Presentamos un análisis de las estrellas HR 3273, HR 8118, HR 8567 y HR 8937. Utilizamos espectros echelle tomados con el telescopio de 2.1 m del CASLEO y modelos de atmósferas de ATLAS9. El He resultó por debajo del valor solar para las estrellas HgMn. El O resultó levemente sobreabundante en HR 3273 y HR 8567. MgII resultó por debajo excepto para HR 8118. El SiII resultó aproximadamente solar en HR 8118 y HR 8937, y por debajo en HR 3273 y HR 8567. El Fe resultó levemente sobreabundante en HR 8118 y HR 8937 y subabundante en HR 3273 y HR 8567. Las especies Sc, Ti, Cr, Mn, Sr, Y y Zr resultaron sobreabundantes mientras que el Ni resultó estar por debajo del valor solar.

ABSTRACT

This work is part of our current study for verifying a possible relation between abundances of HgMn stars with stellar parameters, rotation and age. We present an analysis of the stars HR 3273, HR 8118, HR 8567 and HR 8937. We used echelle spectra taken with the CASLEO 2.1 m telescope and ATLAS9 model atmospheres. HeI was underabundant for the HgMn stars. O was slightly underabundant in HR 3273 and HR 8567. MgII was underabundant except for HR 8118. SiII was close to solar in HR 8118 and HR 8937, and underabundant in HR 3273 and HR 8567. Fe was slightly underabundant in HR 3273 and HR 8567, and slightly overabundant in HR 8118 and HR 8937. The species Sc, Ti, Cr, Mn, Sr, Y and Zr were overabundant while Ni was underabundant.

*Key Words:* stars: chemically peculiar — stars: individual (HR 3273, HR 8118, HR 8567, HR 8937)

## 1. INTRODUCTION

The mercury-manganese (HgMn) stars belong to a group of chemically peculiar (CP) stars observed in the upper main sequence. Their hydrogen spectral types are usually B7-B9 with effective temperatures between 10000 K and 15000 K. HgMn stars show typically intensified lines of Hg (up to ∼5 dex), Mn (up to ∼3 dex) and a deficiency of He. This group shows an unusually high proportion of multiple systems: more than two thirds of them are spectroscopic binaries (SBs), many of which are double-lined systems (e.g., Hubrig & Mathys 1995). They are usually slow rotators (e.g., Abt, Chaffee, & Suffolk 1972) and they show no evidence of large-scale organized magnetic fields (e.g., Auriére et al. 2007, 2010; Makaganiuk et al. 2011).

The relation of the anomalous abundances and stellar parameters is not totally clear. Some authors found no correlation between the total HgII abundance and the effective temperature (e.g., Smith 1997; Woolf & Lambert 1999), while Dolk, Wahlgren, & Hubrig (2003) found a possible correlation for a sample of 31 HgMn stars. On the other hand, Smith & Dworetsky (1993) and later Jomaron, Dworetsky,