

Physical conditions and nature of chemical anomalies in the atmosphere of Sirius A

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Abstract. On the basis of the analysis of the observed equivalent line widths of Fe I, Fe II, Ti II in the spectra of α CMa and o Peg and calculation of abundances of these elements, oscillator strengths of the lines used are refined. With the improved oscillator strengths the iron and titanium abundances in the atmosphere of Sirius A are obtained with a higher accuracy than previously: $\lg N(\text{Fe I}) = 7.899 \pm 0.011$, $\lg N(\text{Fe II}) = 7.908 \pm 0.010$, $\lg N(\text{Ti II}) = 5.289 \pm 0.020$. The improved accuracy allowed one to conclude that the surface magnetic field is absent in the atmosphere of Sirius A: $H^s = 0 \pm 100$ G. The equivalent widths of helium carbon and nitrogen lines of the red region of the spectrum are measured. The calculations of these lines with allowance for their blending with lines of other elements show normal helium abundance. From a comparison of features of α CMa and o Peg an assumption is made on possible reasons for the existence of the phenomenon of Am stars.