PROBABLE EXCESS OF LITHIUM IN THE ATMOSPHERE OF THE MAGNETIC STAR β CORONAE BOREALIS

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Four spectrograms of β Coronae Borealis (F0p) taken with the grating spectrograph of the Merate Observatory, at a dispersion of 35 Å/mm, show a moderately strong line at λ 6708. The only possible identification is that with the resonance doublet of Li I at λ 6707.74 and λ 6707.89. Table I gives the equivalent widths of the Li I line and, for comparison, those of a blend of Gd II and Fe I at λ 6704.5.

TABLE I

EQUIVALENT WIDTHS

Plate	Date (UT) 1963	$W_{\lambda 6708}$	$W_{\lambda 6704.5}$	Remarks
H 1680	May 5.98	0.21	0.28	
H 1695	16.85	(0.31)	(0.45)	defective plate
H 1696	16.89	0.15	0.30	
Fa 1700	17.05	0.16	0.30	

Using the solar curve of growth, with $\log c/v = 5.16$[1] and the curve of growth for β Coronae Borealis[2] with $\log c/v = 4.85$ and assuming $-\log W/\lambda\ (\text{sun}) = 6.52$,[3] we find that the total abundance of lithium in the atmosphere of β Coronae Borealis is at least 1000 times higher than in the solar atmosphere. The lower limit is obtained by reducing the measured equivalent width for Li I by a factor of two in order to allow for possible errors due to the relatively low dispersion. This result confirms the hypothesis proposed by Fowler, Burbidge, and Burbidge[4] that light elements like deuterium, lithium, beryllium, and boron might be produced by a spallation process in the atmospheres of the magnetic stars. Another proof of this hypothesis has been recently given by the observations of Sargent, Searle, and Jugaku[5] that beryllium is probably overabundant by a factor of 100 in the atmospheres of the magnetic stars.

Observations of several magnetic stars in the λ 6700 region of the spectrum are in progress.

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Editor's note: This paper was received prior to publication of an abstract on the same subject by G. Wallerstein, G. H. Herbig, and P. Conti (*A.J.*, **68**, 298, 1963).