

Identification of the (+2) Sequence of the CN Red System ($A^2\Pi-X^2\Sigma$) in Carbon Stars

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Identification of spectral lines from $\lambda 7700$ to $\lambda 8800$ has been carried out in twenty-four carbon stars: AQ And, UU Aur, W CMa, Y CVn, X Cnc, ST Cas, WZ Cas, AX Cyg, RS Cyg, U Cyg, V 460 Cyg, RY Dra, UX Dra, BL Ori, W Ori, RX Peg, Z Psc, 19 Psc, S Sct, Y Tau, VY UMa, HD 137613, HD 156074, and HD 182040. The spectrograms used for this purpose were obtained at the coude foci of spectrographs attached to 100-inch reflector of Mt. Wilson, 200-inch reflector of Mt. Palomar, and 74-inch reflector of Okayama. From the microphotometric tracings of each spectrogram, it was found that the main contributors to the spectral features of the region investigated are lines of the CN Red System ($A^2\Pi-X^2\Sigma$), and lines of the C_2 Phillips system ($b^1\Pi_u-x^1\Sigma_g$) are minor ones. The wavelengths of the band heads of the vibrational transitions of these diatomic molecules are in the CN System (+2) sequence: (2,0) $\lambda 7873$; (3,1) $\lambda 8067$; (4,2) $\lambda 8271$; (5,3) $\lambda 8485$; and (6,4) $\lambda 8709$; and in C_2 Phillips System (+3) sequence (3,0) $\lambda 7715$; (4,1) $\lambda 7908$; (5,2) $\lambda 8108$; and (6,3) $\lambda 8316$. In this note, a comparative survey of the spectral features around each band head of the (+2) Sequence of CN Red System was carried out. Generally speaking, except for U Cyg almost all subclasses from early-type carbon stars to late-type show similar and well developed features of this sequence. Identification of each spectral feature in the microphotometric tracings is graphically illustrated.