INFRARED EMISSION STUDIES OF THE $A^3\Sigma^-$-$X^3\Pi$ ELECTRONIC TRANSITION OF SiC

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The gas phase infrared emission spectrum of the $A^3\Sigma^-$ - $X^3\Pi$ electronic transition of SiC has been observed using Fourier transform spectrometer. The SiC radical was generated by a dc discharge in a flowing mixture of $(CH_3)_6Si_2$ and He. Three bands 1-0 (4577.8 cm^{-1}), 0-0 (3723.1 cm^{-1}) and 0-1 (2769.8 cm^{-1}) have been observed, out of these the last two were observed for the first time[a]. Altogether more than 1100 transitions have been assigned and these data were simultaneously least squares fitted and obtained the molecular constants for SiC in the $A^3\Sigma^-$ and $X^3\Pi$ electronic states. The vibrational frequency ν_0 in the A state was determined to be 854.6994(7) cm^{-1}, which is close to the matrix result[b] 854.2 cm^{-1}.

[a] 4577.8 cm^{-1} band was first observed by Brazier et.al.[J. Chem. Phys., 91, 7384(1989)] and they identified it as 0-0 band.

[b] M. Grutter, P. Freivogel and J. P Maier, J. Phys. Chem. A, 101, 275(1997)