LASER SPRECTROSCOPIC STUDIES OF Si_3C AND Si_3

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Laser experiments to measure the electronic spectra of Si_3C and Si_3 in the gas phase by R2C2PI spectroscopy with Time of Flight Mass Spectrometry will be presented. The strong $\tilde{C}^1B_1 \longleftarrow \tilde{X}^1A_1$ transition of Si_3C is detected at 24933 cm^{-1}. The complex band profile can be explained as vibrational progressions from at least two modes. Using matrix data from J. Fulara et al.[1], the $^1A_1 \longleftarrow \tilde{X}^1A_1$ band of Si_3 at 18605 cm^{-1} has also been observed. The status of the search for the microwave spectrum of Si_3C on the basis of recent high level ab initio calculations will be discussed. Both molecules are of astronomical interest because they are structurally similar to the known astronomical SiC_2 and SiC_3 species.

[1] J. Fulara, P. Freivogel, M. Grutter, and J. P. Maier, J. Phys. Chem. 100, 18042 (1996).