THE ROTATIONAL SPECTRA OF THE SILICON ISOTOPIC SPECIES OF SiCC

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Until this work, the rotational spectra of the silicon isotopic species of SiCC were based almost entirely on astronomical frequencies, because only the fundamental $1_{0,1} - 0_{0,0}$ transition $^{29}SiC_2$ and $^{30}SiC_2$ had been measured in the laboratory.[a] We have now derived precise rotational and centrifugal distortion constants from laboratory measurements of 35 transitions of each isotopic species between 140 and 360 GHz with $J \leq 10$ and $K_a \leq 8$. The rotational spectra calculated with the laboratory measured constants are about two orders of magnitude more accurate than that of He *et al.*,[b] who determined the spectroscopic constants from about 20 lines of $^{29}SiC_2$ and of $^{30}SiC_2$ in the wide-line source IRC+10216. The new laboratory measurements should aid assignment of the silicon isotopic species of SiCC in the spectral line survey of IRC+10216 with the SMA,[c] and in future observations with ALMA.

[a] R. D. Suenram, F. J. Lovas, and K. Matsumura, *Astrophys. Journ. Lett.* **342**, L103 (1989)

[b] J. H. He, Dinh-V-Trung, S. Kwok, H. S. P. Müller, Y. Zhang, T. Hasegawa, T. C. Peng, and Y. C. Huang, *Astrophys. Journ. Suppl. Ser.*, **177**, 275 (2008).

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