Millimeter-wave Spectroscopy of Thiophene

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Hetero five-membered ring molecules may be potential candidates of interstellar molecules. Thiophene(C_4H_4S) is one of this kind of rings that contains sulfur atom. Kretschmer and colleagues reported the results of rotational spectroscopy of ^{32}S-, ^{33}S-, and ^{34}S- thiophene isotopomers in 1993[1]. Up to 30 GHz was covered in their study. Also in 2008, Although the infrared spectra of the v_{14} and v_8 vibration bands using synchrotron radiation was reported[2,3], it is still not enough to have rotational transition frequencies in the millimeter-wave region. In this paper, we extend frequency range and provide accurate rest frequencies.

In this research, we used our conventional source-modulation microwave spectrometer and measured in the 50 to 100 GHz. An example is shown in the Figure. Prediction was carried out based on the previous study [3]. Assignment and analysis using SPFIT and SPCAT suites [4] are in progress. We will report our current status.

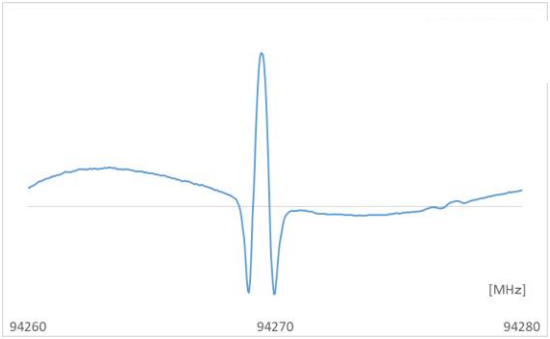

Figure: An example of millimeter-wave spectrum in the 942 GHz region.

References

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