Title	On the 1.5cm Wave Length Microwave Absorption Spectrum of CH_3Br
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11. On the 1.5 cm Wave Length Microwave Absorption Spectrum of CH_3Br.

Isao Takahashi, Akira Okaya, Toru Ogawa and *Tsuneo Hashi.*

With our 1.5 cm microwave spectroscope, we observed the rotational transition J. K. (0, 0)→J. K. (1, 0) of CH_3Br^{79} and CH_3Br^{81}. The absorption frequencies were measured with the cylindrical cavity wave meter operating in TE_{011} mode and our results are summarized in the following table in comparison with the theoretical values.

Absorption frequencies of CH_3Br^{79} (ground vibrational state)

Transition	Freq. (obs.) Mc/s	Freq. (theo.) Mc/s	
F=3/2→1/2	1899_4	18992	
3/2→3/2	1926_2	19252	
3/2→5/2	1910_3	19108	ν_0=19197 Mc/s

Absorption frequencies of CH_3B^{81} (ground vibrational state)

Transition	Freq. (obs.) Mc/s	Freq. (theo.) Mc/s	
F=3/2→1/2	1896_0	18943	
3/2→3/2	1917_0	19160	
3/2→5/2	1906_8	19040	ν_0=19064 Mc/s

where ν_0 is the frequency of the unsplit rotational line. These satellite structures are caused by interaction of the nuclear quadrupole moment of Br with the molecular field.

Thus we checked our set within the error of our frequency measurement. Our cavity wave meter can only afford the measurement to the accuracy of ±10 Mc/s at 1.5 cm wave length.

We gave up the intensity comparison among absorption lines, because of the difficulty in adjusting all circuit components for each line, and especially for the lines lying not in the same electronic tuning range of klystron, and further the output power of klystron can not be kept constant without necessary procedure over the range of electronic tuning.

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12. On the Production of 1 cm Wave.

Isao Takahashi, Akira Okaya, Toru Ogawa and *Tsuneo Hashi.*

We used klystron 2K25 for the production of fundamental wave of 3 cm wave length.

We succeeded to convert it to 1 cm energy, where the frequency converter consisted of ridge type wave guide, coaxial line and silicon crystal detector as in the case of our 1.5 cm wave length microwave spectroscope.

This 1 cm wave is intended to be used for microwave spectroscopy.