DETECTION OF VAN DER WAALS VIBRATIONAL TRANSITIONS USING A NEW MW-THz DOUBLE RESONANCE TECHNIQUE

VLADIMIR MARKOV, [a] YUNJIE XU, and WOLFGANG JÄGER, *Department of Chemistry, University of Alberta, Edmonton, AB, Canada, T6G 2G2*.

A new double resonance technique has been developed that can be used for the detection of low frequency van der Waals vibrations. The technique uses backward wave oscillators (OB-24, OB-30, ISTOK), which are phase-locked to a KVARZ mm-wave synthesizer (78-118 GHz), as pump sources, [b] and a pulsed jet cavity Fourier transform microwave spectrometer for detection. Initial measurements were done on the Ar-CO system [c] for which the THz frequencies of ro-vibrational transitions from the ground to the first excited van der Waals bending state were known from previous measurements. [d] Resolving power and sensitivity of the technique will be discussed.

---

[a] permanent address: Institute of Applied Physics of the Russian Academy of Sciences, Ulyanova St. 46, 603600 Nizhnii Novgorod, Russia.

[b] G. Winnewisser, A. F. Krupnov, M. Yu. Tretyakov, M. Liedtke, F. Lewen, A. H. Salek, R. Schieder, A. P. Shkaev, and S. V. Volokhov, J. Mol. Spectrosc. 165, 294 (1994).

[c] Y. Xu and A. R. W. McKellar, Mol. Phys. 88, 859 (1996).

[d] M. Hepp, R. Gendriesch, I. Pak, F. Lewen, and G. Winnewisser, J. Mol. Spectrosc. 183, 295 (1997).