HIGH RESOLUTION FTIR SPECTROSCOPY

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We plan to first present an overview of the recent high resolution FTIR literature. We shall then highlight three specific experimental developments to which our research group is contributing, using Bruker IFS120HR instruments: Absolute intensities measurements, FT-ICLAS and FT-jet spectroscopy.

Absolute intensities measurements in the infrared range aim nowadays at 1% accuracy for chemically stable molecules and 5% for unstable species. Recent achievements in Brussels will be presented.

In FT-ICLAS, the aim is to improve the absorption detection sensitivity. The experiment combines IntraCavity Laser Absorption Spectroscopy (ICLAS) with FTIR spectroscopy. ICLAS is a well known instrumental technique in which a sample is inserted in a cell placed inside a broadband, multimode laser cavity. The laser is operating in pulsed mode and intracavity absorption rises as the laser wave builds up. An equivalent absorption pathlength of several kilometers is currently generated, leading to ultra high sensitivity.[a] Different research groups have now performed such experiments with FTIR instruments to resolve the intracavity absorption, rather than with grating spectrographs with CCD detection. The set-up in Brussels will be detailed.

In FT-jet spectroscopy, the FT instrument is equipped with a supersonic expansion. Such experiments have now been reported by several research groups.[b] The efficiency of this instrumental combination will be illustrated and recent developments in Brussels will be presented.

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[a] M. Herman, J. Liévin, J. Vander Auwera and A. Campargue, *Adv. Chem. Phys.* **108** (1999) 1–418.
[b] M. Herman, R. Georges, M. Hepp, and D. Hurtmans, *Int. Rev. Phys. Chem.* **19** (2000) 277–325.