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Study of biogenic volatile organic compounds in French Guiana tropical forest using the TD-GC/MS/FID technique

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This paper presents a study of biogenic volatile organic compounds (BVOC)¹ speciation such as isoprene, α -pinene, β -pinene, limonene, ϵ - β ocimene, among others measured at the Guyaflux Tower located in a wet tropical forest in French Guiana and analyzed by a thermo desorption unit, gas chromatographer coupled to a mass spectrometer and a flame ionization detectors: TD-GC/MS/FID. The BVOC samples were collected through commercial cartridges containing different absorbents in it. The results showed that using a TD-GC/MS/FID coupled system it was possible to speciate more than fifteen organic compounds². The TD unit was used to desorb the cartridges, while the GC (DB 5 column) was used to separate the BVOC, the MS was used to identify all the compounds and the FID was used to quantify them. It was also shown that isoprene was by far the biogenic volatile organic compound observed followed by α -pinene and β -pinene. The electron impact ionization is, originally, a mass spectrometry ionization method and still the most widely used of all ionization methods. In this technique, a beam of electrons passes through the gas phase sample. An electron that collides with a neutral analyte molecule can knock off another electron, resulting in a positively charged ion. The fragmentation process depends upon many qualities including primary structure, electron energy and ion source temperature. In the last decades, it has become increasingly clear that samples characterized by several hundreds or even thousands of volatile constituents are of common occurrence. Details of the methodology and data analysis are present in this paper.

Key words: GC/FID. GC/MS. VOCs. Tropical Forest.

Subject-matter: Environmental science.

¹Kuhn, U. et al, 2007. *Atmos. Chem. Phys.*, 7, 2855-2879.

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