# DEVELOPMENT OF ON-LINE AND FIELD DUAL TD-GC-FID/MS FOR AUTOMATIC AND CONTINUOUS AMBIENT AIR MONITORING

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Ambient air is polluted by many Volatile Organic Compounds (VOCs) coming from anthropogenic and natural sources. VOCs from PAMS, TO14 and TO15 lists can be measured in many ranges of concentration, from $ng/m^3$ up to $mg/m^3$ depending on the location of the measurements. Due to the large number of molecules, the complete separation of all compounds is difficult to perform using chromatographic columns. Therefore, it is difficult to quantify precisely all compounds using a chromatograph equipped with a nonspecific detector. The goal of this study is to perform automatic and continuous identification and quantification of VOCs using a dual Thermal-Desorber Gas Chromatograph equipped with two Flame Ionization Detectors (FIDs) and one Mass Spectrometer (MS). The device is required to identify automatically coeluted compounds by MS technology adapted to industrial context. The coupling of two different TD-GC-FIDs to a Quadrupole MS allowed by an elaborated multiplexer system is the originality of the project: one TD-GC-FID for monitoring of light compounds and one for heavy compounds with specific analytical conditions for each system. A measurement campaign in petrochemical new site shows the concentration of about 100 compounds at different steps of the commissioning. Thanks to the continuous measurements every 30 minutes, variations of concentrations during specific hours can be monitored. Potentially coeluted compounds like terpenes or organochlorinated are identified and monitored at ppt level. This fully automatic system allows non-specialist operators to access expertise level results.

**Keywords:** Gas Chromatography, Mass spectroscopy, Volatile Organic Compounds, On-line Monitoring