

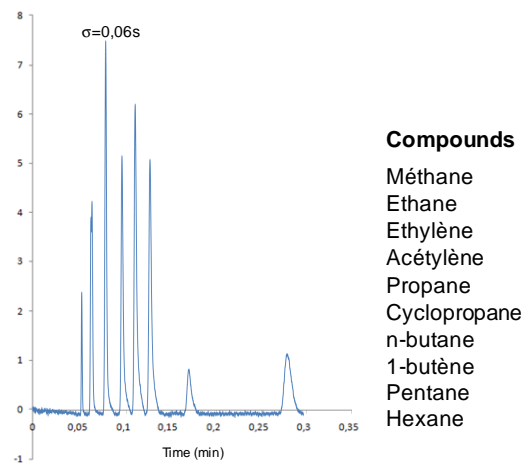


**Développement de l'UPGC (Ultra Performance Gas Chromatography) basée sur des colonnes capillaires monolithiques**

**Development of UPGC (Ultra Performance Gas Chromatography) with monolithic capillary columns**

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The PhD subject is focused on the development of new separation tools to reach ultra performance in gas chromatography with applications in industrial and laboratory analysis. The main targets are size and analysis time reduction in order to carry out gas analysis according to industry requirements. So new original tools will be designed based on monolithic capillary columns, with operating pressure as high as 60 bar. Such integrated device will operate in non-conventional GC conditions (very short column, high pressure, high gradient rate, fast spectral detector).



**High speed separation on silica monolithic column**

Preliminary results obtained with capillaries designed in TechSep team (see figure) have already demonstrated the ability to separate industrial mixtures in short time (less than 15 s) taking into account the instrumental constraints (2016 J Chromatogr A - Behavior of short silica monolithic columns in high pressure gas chromatography).

The fundamental part of the research project aims to understand separation processes with high pressure of carrier gas which lead to original selectivity control and high efficiency. Several monolithic columns with controlled surface properties will be designed, hyphenated with specific injectors and detectors, and used to solve analytical problems encountered by the industrial partners of the project. This PhD project is proposed after several collaborations performed between research teams (Separative Techniques and Thermal Analysis-Gaz-COV) from the Institute of Analytical Science, chemical companies and instrument providers.