

A MINIATURIZED GAS-CHROMATOGRAPHIC LIKE SYSTEM FOR FISH QUALITY ASSESSMENT: SUB-PPM DMA AND TMA MEASUREMENTS IN AIR MIXTURES

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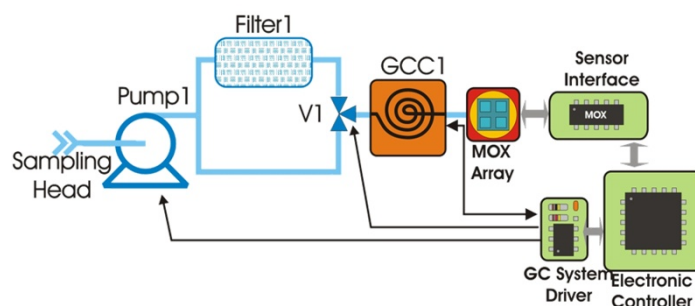
Abstract

A reliable quantitative evaluation of the relevant target gases present in a complex air mixture is required for quality assessment in several different application fields (environmental, agro-food, etc.). Nowadays complex gas chromatographic systems are used for this purpose. They generally are bulky and expensive laboratory instruments requiring specific and complicated sampling procedures.

In recent years CNR-IMM Bologna has been developing miniaturized systems based on a gas chromatographic-like approach in order to perform quantitative analyses on gas mixtures [1,2]. These systems rely on a very simple architecture exploiting the features of purposely designed micromachined devices. Arrays of MOX gas sensors are used as very sensitive detectors in combination with silicon made gas chromatographic micro-columns, making possible to implement a simplified sampling and injection system. No external carrier gas bottles are required, resulting in portable stand-alone system.

Starting from this basic architecture, by applying specific changes we are able to adapt the system to different kinds of applications.

In this work we will consider the development of a miniaturized system for agro-food applications, specifically targeted to fish quality assessment. After a brief presentation of the overall system architecture and of the characteristics of the relevant micromachined devices, we will discuss the particular solutions adopted to solve the problems directly related with the dimethylamine (DMA) and trimethylamine (TMA) detection. Finally we will present characterization results proving the capability of the system to analyze the target gas mixtures, by separating and quantifying DMA and TMA at concentrations lower than 1 ppm.



Schematic overview of the miniaturized gas chromatographic like system .

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