ABSTRACT FOR POSTER PRESENTATION
15th GC×GC in Riva del Garda

Solid State Modulated GC×GC

Sjaak de Koning, Lena Dubois, Delphine Zanella, Pierre-Hugues Stefanuto, Jean-François Focant
Da Vinci Laboratory Solutions, Sydneystraat 5 3047BP Rotterdam, the Netherlands; solutions@DaVinci-LS.com

Organic and Biological Analytical Chemistry Group, MolSys, University of Liège, Belgium

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The first dual-stage thermal modulator for GC×GC was invented by Liu and Philips in 1991 [1]. Air at ambient temperature was used for trapping, and releasing was done by resistive heating of the modulation column. In 1997, Marriott and Kinghorn [2] demonstrated a modulator device, where a cryogenically cooled trap was moving oven the column inside the GC oven. Current commercially available modulators use non-moving jets, using CO_2 or N_2 gas (chilled using LN_2). The amount of gas and liquid supplied for these modulators lead to high operational costs.
In this contribution is a two-stage solid state modulator demonstrated. Compounds eluting from the first-dimension column move via the 1st hot-zone into a thermo-electric cooler (TEC) where they get trapped. Following, the column is moved, such the part containing the trapped compounds comes in the 2nd hot-zone, where the compounds are rapidly released to the second-dimension column. While releasing, compounds coming from the first-dimenstion column are trapped in the TEC (stage 1). After the release time, the column moves back, so the compounds trapped during the release time get remobilised in the 1st hot-zone and re-trapped in the TEC (stage 2). After the trapping period, the column moves again to release the compounds.
Analytical performance of the two-stage solid state modulator is comparable to the well-known two-stage modulators. Modulated peak widths are 20 – 25 ms and compounds are modulated from C_2 till C_{40+}

1. Z. Liu, J. Phillips, *J. Chromatogr. Sci.* 29 (1991) 227.
2. P.J. Marriott, R.M. Kinghorn, *Anal. Chem.* 69 (1997) 2582.