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# **SELECTABLE 1D OR 2DGC-OLFACTOMETRY/MS WITH PREPARATIVE FRACTION COLLECTION SYSTEM FOR IDENTIFICATION OF ODOR ACTIVE COMPOUNDS**

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Identification of trace amounts of odor active compounds in complex samples like natural products can be challenging. Simultaneous olfactometric and mass spectrometric detection can help locate the region of interest within the complex chromatogram, but lack of sufficient resolution and/or sensitivity may still preclude reliable identification. Heart-cutting 2DGC-MS can significantly improve the resolution of complex region. In 2009, we developed a novel selectable 1D or 2DGC-MS system using capillary flow technology (CFT) and low thermal mass GC (LTM-GC) for simple and fast operation of both 1DGC-MS and 2DGC-MS using a single GC-MS system [1]. The selection of 1D or 2DGC-MS operation is only performed by “Change of the method” with click of the mouse without any instrumental setup change. Also, this system can eliminate preliminary analysis with “monitor FID” for the selection of heart-cut region, and can provide “monitor TIC” for the 1<sup>st</sup> column separation on 2DGC-MS analysis. Moreover, simultaneous olfactometric and mass spectrometric detection is possible on both first and second dimensional GC separations. However, 2DGC-Olfactometry/MS (2DGC-O/MS) does not obtain mass spectrum for the olfactory detected compounds in some cases (no peaks on the second dimensional TIC at the corresponding retention times), particularly when analyzing highly complex aromas. In this case, it is essential to have enrichment step before final MS detection. Therefore, preparative fraction collection (PFC) with Tenax adsorbent tube is combined with the selectable 1D or 2DGC-O/MS system. After enrichment of the olfactory detected compound over ten injections and 2DGC separations, the trapped compound is thermally desorbed into the same system. Finally, the desorbed compound is analyzed by 2DGC-O/MS.

In this study, a method is presented for identification of trace amounts of odor active compounds using the selectable 1D or 2DGC-O/MS with PFC system. The performance of the system is demonstrated with food samples.

[1] K. Sasamoto, N. Ochiai, in: Abstract of the 33rd ISCCE and 6th GCxGC symposium, Portland OR, USA, May 17-21, 2009, CASSS, p 92.