# Multi-dimensional gas chromatography for the separation of alkenones from interfering compounds

T. Blanz
G. Petrick
D. E. Schulz-Bull

Department of Marine Chemistry, Institute for Marine Research at the University of Kiel, Germany

Long chain di-, tri- and tetra - unsaturated methyl and ethyl ketones (alkenones), which are found in marine sediments throughout the oceans, supply a widely used new technique to estimate past sea-surface temperatures. Apart from alkenones organic material recovered from sediment traps and seafloor contain $C_{36:2}$ and $C_{36:3}$ methyl esters. The methyl esters interfere with the quantification of $C_{37:2}$ and $C_{37:3}$ alkenones by GC. To eliminate these effects different methods of sample clean-up and extraction are used (saponification, HPLC, column chromatography). Determination of the relative composition index $U^{K}_{37}$ by one-dimensional GC follows these methods.

Using multi-dimensional GC (MDGC) we can eliminate the negative effect of methly esters and unambigously identify the alkenones. At the same time our sample preparation is not destroyer, considerably faster, reproducable, and sensitive, producing the same precision as one-dimensional GC. MDGC allows a selected small fraction of the eluate of a high-resolution capillary column to enter a second capillary column with different characteristics for further separation. Thus, co-eluting compounds can be separated on the second column. The columns are in separate ovens and connected to separate detectors.

Analyses of the same sample with one-dimensional and multi-dimensional GC yielded different results of the relative composition index $U^{K}_{37}$, which probably are caused by methyl esters interfering in the one-dimensional GC analyses and need to be investigated further. These differences will affect the calculation of SST yielding different temperatures for the results of one-dimensional and multi-dimensional GC.