A new High Temperature Carbowax Column stable up to 300°C for FAST-GC and GCxGC use.

Mario Galli (1), Stefano Galli (1)
1: MEGA s.n.c. - Capillary Columns Laboratory, Legnano (MI) - Italy

Introduction
Carbowax polar stationary phases are the most used in GC separations in conjunction with 5% phenyl apolar columns. For example, PE1 columns are very often used in isotopic GC. However, polar Carbowax Composites, in recent years, have displayed a need for high temperature stability, especially for FAST-GC and GCxGC systems. In this context, we show that a high-temperature phase can be used for these systems.

For these reasons, MEGA has developed a new Carbowax-based column called MEGA-Wax HT, able to reach over 300°C and maintain the temperature of 300°C in isothermal mode.

Experimental Results

1. BIODIESEL Analysis on MEGA-Wax HT.

Biodiesel analysis presents a significant challenge from the analytical point of view. There are many methods implemented in the GC Biodiesel analysis to determine free and total Fatty Acids (FA), Acid Value, and Total Fatty Acid Methyl Ester (FAE) content. We tested a Biodiesel neat sample obtained on a new MEGA-Wax HT column. The results are reported in Figure 3 and show the possibility to extend the use of a polar Carbowax phase also for this kind of high temperature analysis. The MEGA-Wax HT works very well at high temperatures, requiring lower oven units at 300°C in isothermal mode, while keeping an high sensitivity for all the components. The analysis was performed using a 3% Phenyl Carbowax column as the one described in the EN 14104 method (see the Figure 4 below). The aim of this example is to demonstrate the potential use of the MEGA-Wax HT in Gas Chromatography. The column could be applied to the GC analytical technique in order to have a second dimension column that allows to maintain an orthogonality while reaching high-temperature analyses for these applications.

2. POLYVAX 500 Analysis on MEGA-Wax HT.

Figure 5. A POLYVAX 500 analysis on a 0.32 mm ID x 10 m L (1.0 mm incorporated retention gap) x 0.51 um HT, MEGA-Wax HT columns. Another example of the use of the new MEGA-Wax HT stationary phase for high temperature works. The sample 5% POLYVAX 500 was tested on the Column mode.

Conclusions
The new MEGA-Wax column HT represents a novelty in the panorama of high polarity phases Carbowax. We think that the examples shown in the Supplementary Information of this paper prove the need for new polar phases with an extended temperature range, especially to reach the modern needs of FAST-GC and GCxGC. As the present time in the Comprehensive 2GC is the key to finding the best compromise between temperature limits of the column system and orthogonality between the two dimensions because of temperature limits given by more polar (and used phases like Carbowax). We can now offer these limits a bit higher with the new MEGA-Ht column.

Furthermore, this column may be well used for conventional GC in combination with an apolar stationary phase and for GCxGC systems. These systems are often used in R&D for example, where the use of the column temperature range of the apolar columns is limited. For example, the 3% Phenyl Carbowax phase was used to reduce the temperature limits of the normal Carbowax-based phases.

We are still performing applications on this new stationary phase to find the maximum effective operating limits in temperature programmed mode with the best compromise of column retention. We are going on with the investigation on the possibility to use the WAS-Ht for triglycerides analysis with the advantage to state these heavy compounds before their decomposition temperature.

Click here and read the LCGC article about the new MEGA-Wax HT column.

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