Introduction

Sol-Gel-1ms™ is a new technology 100% methyl capillary column. The phase of this column has been custom designed for mass spectroscopy applications but can be used successfully with all other GC detectors. The upper maximum temperature of the column is 380°C and the column has extremely low bleed as shown in Figure 2b at 320°C. This column is a bonded polydimethylsiloxane stationary phase encapsulated in synthetic glass (sol-gel) material and the whole matrix is itself bonded to the surface of the fused silica capillary. The anchoring of the matrix to the glass surface using this unique technology leads to a very inert, high temperature column. The phase is schematically represented in Figure 1.

Figure 1. Schematic representation of SolGu-1ms.

The low bleed of the Sol-Gel-1ms column gives rise to better sensitivity (increased signal-to-noise ratio) for compounds eluting at higher oven temperatures (Figure 2a). Also, lower bleed will result in less ion source maintenance of the mass spectrometer due to less phase deposition on mass spectrometer components. A comparison of the bleed of Sol-Gel-1ms column against a competitor’s MS-grade column can be seen in Figure 2b.

Figure 2a. The effect of lower bleed can be seen in better sensitivity using a Sol-Gel-1ms column.

Figure 2b. Bleed profile of a competitor’s MS-grade 100% methyl column, BPI and Sol-Gel-1ms.

The sol-gel portion of the phase imparts no polarity to the phase. This is important as the column can be easily substituted for any 100% methyl column without a change of elution order. Figure 3 shows a comparison in elution order to a SGE BPI column which is a conventional 100% methyl column.

Figure 3. Polarity comparison of Sol-Gel-1ms vs BPI (100% methyl column).

The analysis of Polynuclear Aromatic Hydrocarbons (PAH) on Sol-Gel-1ms shows how this unique technology leads to a very inert, high temperature column. The phase is schematically represented in Figure 4.

Figure 4. Analysis of Polynuclear Aromatic Hydrocarbons (PAH) on Sol-Gel-1ms.

The effect of lower bleed can be seen in better sensitivity using a Sol-Gel-1ms column. As well as environmental applications, this column is also ideal for:

- Pharmaceuticals
- Food Additives
- Hydrocarbons (petroleum products)

Figure 5. Analysis of Polynuclear Aromatic Hydrocarbons (PAH) on Sol-Gel-1ms.

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