Abstract

Open Tubular Columns play an important role in today's chromatographic processes. The modification of a conventional GC system to perform satisfactorily with OTC or bundles of OTC, and the preparation of bundles of OTC that have a unique relationship peak-component is reported. The effect of the variability of the parameters length and diameter in the OT columns of a bundle was also studied. A mathematical relation between the broadening of the bundle peak and the single OTC peak was derived, giving the following general relation:

$$\overline{S_T^2}\left(\overline{F}+\sum_i \frac{\overline{\partial^2 F}}{\partial w_i^{\,2}} s_i^2\right)=\overline{FS^2}+\sum_i s_i^2\left[\left(\frac{\overline{\partial S}}{\partial w_i}\right)^2 \bullet 2\overline{F}+2\overline{FS}\left(\frac{\overline{\partial^2 S}}{\partial w_i}\right)+ 4\overline{F}\left(\frac{\partial \overline{m}}{\partial w_i}\right)^2+4\overline{S}\left(\frac{\overline{\partial S}}{\partial w_i}\right)\left(\frac{\partial \overline{F}}{\partial w_i}\right)+\overline{S^2}\left(\frac{\partial^2 F}{\partial w_i^{\,2}}\right)\right]$$

In the experimental range of diameters (180-280 micron) and lengths (450-870 cm) studied, the following expression was obtained:

$$\overline{S_T^2}=\frac{0.088\overline{S^2}+1.27x10^{-3}s_L^2+4.58x10^5 s_{d_c}^2}{0.088+10^{-5}s_L^2+2000s_{d_c}^2}$$