Gas Chromatography

1. Introduction

2. Stationary phases

3. Retention in Gas-Liquid Chromatography

4. Capillary gas-chromatography

5. Sample preparation and injection

6. Detectors

(Chapter 2 and 3 in The essence of chromatography)

Retention in Gas-Liquid Chromatography

A. General descriptors

B. retention and capacity factor: $t_R = t_M(1+k)$

C. Solute retention in Binary stationary phase

D. Temperature and Flow Programming

E. Problem solving

A. General descriptors

(1) t_R, t_R', and t_M

(2) V_R, V_R', and V_M

(3) L_R, L_R', and L_M

(4) $V_R = t_R * F$, and $L_R = t_R * u$

(5) $\sigma_V = \sigma_t * F$, and $\sigma_L = \sigma_t * u$

$$j = \frac{3}{2} \frac{(P_i/P_0)^2-1}{(P_i/P_0)^3-1}$$

$$u_{avg} = j\, u_0 (T_c/T_0) [(P_o-P_w)/P_o]$$

$$F_{avg} = j\, F_0 (T_c/T_0) [(P_o-P_w)/P_o]$$

(6) $k = t_R'/ t_M =$ $\dfrac{\text{the time of solute stay in stationary phase}}{\text{the time of solute stay in mobile phase}}$

(7) $K = k*\beta = k* \dfrac{V_M}{V_S}$

(8) $t_R = t_M(1+k)$

(9) $\alpha = k_1/k_2$

(10) $R_s = (t_{R2}-t_{R1})/[(W_{b1}+W_{b2})/2] = [N^{1/2}/4][(\alpha-1)/(\alpha)]*[k_2/(1+ k_2)]$,