9.2.3.8 Retention Parameters in Planar Chromatography

Mobile-Phase Front

The leading edge of the mobile phase as it traverses the planar media. In all forms of development except radial, the mobile phase front is essentially a straight line parallel to the mobile phase surface. It is also called the *Liquid Front* or *Solvent Front*.

Mobile-Phase Distance

The distance traveled by the mobile phase travelling along the medium from the starting (application) front or line to the mobile phase front. It is the distance *a* in Fig. 9.2.2.

Solute Distance

The distance traveled by the solute along the medium from the starting (application) point or line to the center of the solute spot. If the solute spot is not circular, an imaginary circle is used whose diameter is the smallest axis of the spot. It is the distance *b* in Fig. 9.2.2.

Retardation Factor (R_F)

Ratio of the distance traveled by the center of the spot to the distance simultaneously traveled by the mobile phase. Using the symbols of Fig. 9.2.2:

$$R_F = b / a$$

By definition the R_F values are always less than unity. They are usually given to two decimal places. In order to simplify this presentation the hR_F *Values* may be used: they correspond to the R_F values multiplied by 100. Ideally, the R_F values are identical to the *R* values (see *Retardation Factor*).

R_M **Value**

A logarithmic function of the R_F value:

$$R_M = \log \frac{1 - R_F}{R_F} = \log\left[\frac{1}{R_F} - 1\right]$$

Relative Retardation (R_{rel})

This term is equivalent to relative retention used in column chromatography: it is the ratio of the R_F value of a component to the R_F value of a standard (reference) substance. Since the mobile phase front is common for the two components, the R_{rel} value can be

expressed directly as the ratio of the distances travelled by the spot of the compound of interest (b_i) and the reference substance (b_{st}) respectively:

$$R_{rel} = R_{F(i)} / R_{F(st)} = b_i / b_{st}$$

Note: In former nomenclatures the symbol R_s was used to express relative retardation in planar chromatography. Because of its identity with the symbol for *Peak Resolution* the symbol R_{rel} is suggested for relative retardation in planar chromatography.