



Standard Guide for Supercritical Fluid Chromatography Terms and Relationships¹

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1. Scope

1.1 This guide deals primarily with the terms and relationships used in supercritical fluid chromatography.

1.2 Since many of the basic terms and definitions also apply to gas chromatography and liquid chromatography, this guide is using, whenever possible, symbols identical to Practices E355 and E682.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

2. Referenced Documents

2.1 *ASTM Standards*:²

E355 Practice for Gas Chromatography Terms and Relationships

E682 Practice for Liquid Chromatography Terms and Relationships

3. Names of Techniques

3.1 *Supercritical Fluid Chromatography*, abbreviated as SFC, comprises all chromatographic methods in which both the mobile phase is supercritical under the conditions of analysis and where the solvating properties of the fluid have a measurable affect on the separation. Early work in the field was performed under a broader heading—*dense gas chromatography*. Related work in the field uses subcritical or near-critical conditions to affect separation.

3.2 Separation is achieved by differences in the distribution of the components of a sample between the mobile and stationary phases, causing them to move through the column at different rates (differential migration).

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

3.3 In supercritical fluid chromatography, the pressure may be constant or changing during a chromatographic separation.

3.3.1 *Isobaric* is a term used when the mobile phase is kept at constant pressure. This may be for a specified time interval or for the entire chromatographic separation.

3.3.2 *Programmed Pressure Supercritical Fluid Chromatography* is the version of the technique in which the column pressure is changed with time during the passage of the sample components through the separation column. Isobaric intervals may be included in the pressure program.

3.4 In supercritical fluid chromatography, the temperature may be constant, or changing during a chromatographic separation.

3.4.1 *Isothermal Supercritical Fluid Chromatography* is the version of the technique in which the column temperature is held constant during the passage of the sample components through the separation column.

3.4.2 *Programmed Temperature Supercritical Fluid Chromatography* is the version of the technique in which the column temperature is changed with time during the passage of the sample components through the separation column. Isothermal intervals may be included in the temperature program.

3.5 In supercritical fluid chromatography, the density may be constant or changing during the chromatographic separation.

3.5.1 *Isoconfertic* is a term used when the density of the mobile phase is kept constant for a specified time or for the entire chromatographic separation.

3.5.2 *Programmed Density Supercritical Fluid Chromatography* is the version of the technique in which the column density is changed with time during the passage of the sample components through the separation column. Isoconfertic intervals may be included in the density program.

3.5.3 *Flow Programming* is a technique where the mobile phase linear velocity is changed during the chromatographic procedure. However, with fixed orifice restrictors, flow programming is more complex requiring an increase in pressure to effect an increase in linear velocity.

3.6 In supercritical fluid chromatography, the composition of the mobile phase may be constant or changing during a chromatographic separation.