



Liquid Chromatography AP Chemistry Laboratory #18

Introduction

In this experiment, liquid chromatography is used to separate the substances that are present in grape-flavored Kool-Aid®. First, the dyes responsible for the purple color, FD&C Blue #1 and Red #40 are separated. Then, in a second experiment, the other components of Kool-Aid®, the flavorings and citric acid, are separated as well.

Concepts

- Liquid chromatography
- Resolution
- Selectivity

Background

Chromatography is an important analytical tool used to separate the components of a mixture. These components become separated or *partitioned* between a stationary phase and a moving phase of the chromatography system. The moving phase is either a gas or a liquid and the stationary phase is usually a solid. The mixture to be separated is combined with the mobile phase. As the mobile phase "solution" flows over the stationary phase, the components of the mixture continuously equilibrate between the phases, based on their particular affinity for each phase. A higher attraction for the mobile phase leads to a higher concentration of a component in the mobile phase and a faster transport through the entire system. Components more strongly attracted to the stationary phase take longer to migrate through the system. This results in the components becoming separated into bands that flow through the system at different rates. If the separation, or *resolution*, is sufficient, the bands will exit the system as distinct fractions (Figure 1).

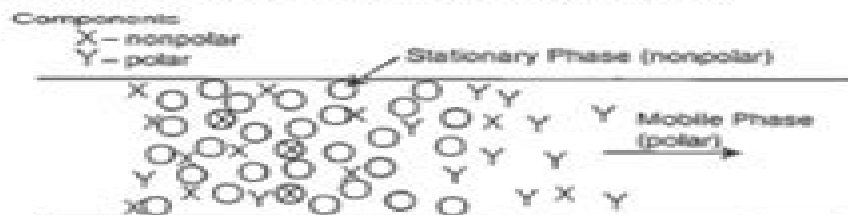


Figure 1.

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Shirley Bayne



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Thomas Scientific, 1998 *Liquid Chromatography* Harold Monroe McNair, 1973* *Forensic Applications of High Performance Liquid Chromatography* Shirley Bayne, 2017-07-27 Chromatography has many roles in forensic science ranging from toxicology to environmental analysis In particular high performance liquid chromatography HPLC is a primary method of analysis in many types of laboratories Maintaining a balance between practical solutions and the theoretical considerations involved in HPLC analysis Forensic App Practical high performance liquid chromatography C. F. Simpson, 1979

Liquid Chromatography, 1996 **A Programmed Introduction to Gas-liquid Chromatography** James Bulmer Pattison, 1969 With many questions and feedback to the answers Introduction to High Performance Liquid Chromatography Hamilton RJ., Richard John Hamilton, P. A. Sewell, 1977 **High-performance Liquid Chromatography**, 1987 **Liquid Chromatography** D. Patel, 1997-06-19 In all biological science laboratories some type of separation techniques will be undertaken Modern separation techniques rely heavily on chromatographic procedures This text provides scientists and technicians with information on the data needed to run liquid chromatography techniques **Liquid Chromatography in Clinical Analysis** Pokar M. Kabra, Laurence J. Marton, 2014-09-01

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