Gas Chromatography

1. Introduction

2. Stationary phases

3. Retention in Gas-Liquid Chromatography

4. Capillary gas-liquid chromatography

5. Sample preparation and inlets

6. Detectors

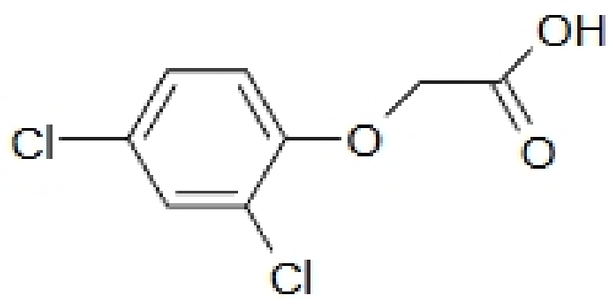
(Chapter 2 and 3 in The essence of chromatography)

Sample preparation and inlet

A. Sample Preparation:

1. The prerequisite in GC separation is that all solutes being separated must be: (a) fairly volatile, and (b) thermally stable.
   (c) Usually, the solute should be dissolved in a non-aqueous matrix (H_2O changes column behevir).

2. Lack of volatility prevents the direct use of GC for many solute. One way to overcome this difficulty is to *derivatize* the solutes into more volatile forms.



2,4-dichlorophenoxyacetic acid
(A cancer suspect agent).

Silylation

3. Derivatization of a solute can be used for any of the following reasons

(a) To increase the volatility of the solute.

(b) To increase the thermal stability of solute

(c) To improve the response for the solute on certain detectors (e.g., incorporating halogen atoms into a solute so that it can be detected using an electron capture detector).

(d) To improve the separation of the solute from other sample components (i.e., changing the structure of a solute will also affect its retention on the column)

4. Most derivatization reactions can be classified into one of three group:

(a) Silylation
(b) Alkylation
(c) Acylation

Most of these reactions are performed using minimal amount of sample and reagents (i.e., 0.1~2.0 mL) are typical carried out at room temperature. Some, however, do require heating to moderate temperatures (60 ~ 100 ^{O}C).