Waters

**An Internal Communication
of Applications and Techniques**

Lab Highlights

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ESTIMATION OF SOIL SORPTION CONSTANTS OF ORGANIC CHEMICALS
BY USING RADIAL COMPRESSION COLUMNS

The impact of Toxic Substances Control Act (TSCA) will require testing of thousands of chemicals to assess their fate in the environment. Considerable attention must be given to development of systematic schemes identifying potentially hazardous chemicals. An evaluation scheme must consider the transport of chemicals in the environment - the degree to which a chemical will move and its tendency to accumulate.

A new LC method for the estimation of soil sorption constants (K_{oc}) has been reported by R. L. Swann, et. al. of Dow Chemical Company (1). The method provides a simple and rapid estimate of a chemical's tendency to partition in a soil matrix. Data generated in this way can be used in the first approximation for fate and hazard assessment of chemicals.

The system used consisted of two Waters Model 6000A Solvent Delivery Systems, a 600 Programmer, a Waters Intelligent Sample Processor (WISP^{TM} 710A), and a Waters Radial Compression Module (RCM-100) equipped with a RADIAL-PAK^{TM} C_{18} Cartridge. The C_{18} cartridge, operated at ambient temperature, was eluted isocratically with a methanol/water mixture (85:15) at a flow rate of 1 ml/min.

A high degree of correlation (correlation coefficient 9.96) was found when the natural log (ln) of the soil sorption constant (K_{oc}) was plotted vs. the natural log (ln) of the retention time (Figure 1) on RADIAL-PAK C_{18}.
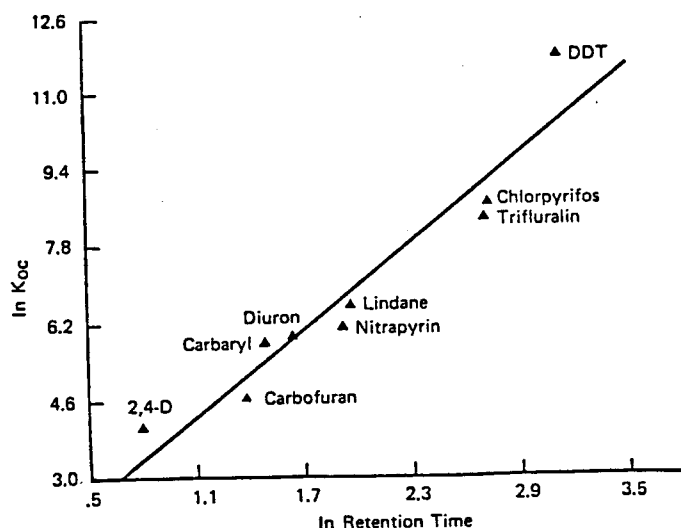

FIGURE 1. CORRELATION OF SOIL SORPTION CONSTANT WITH HPLC RETENTION TIME FOR NINE ORGANIC CHEMICALS.

(1) Aquatic Toxicology and Hazard Assessment, Editors: Branson and Dickson, Fourth ASTM Symposium (Chicago, Illinois), ASTM STP737,43-48

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