

## A ROUTINE METHOD FOR THE SEPARATION AND ISOLATION OF PCBs, PCDDs, AND PCDFs AT THE CONGENER-SPECIFIC LEVEL

Gierczak, R.F., Hallett, D.J.

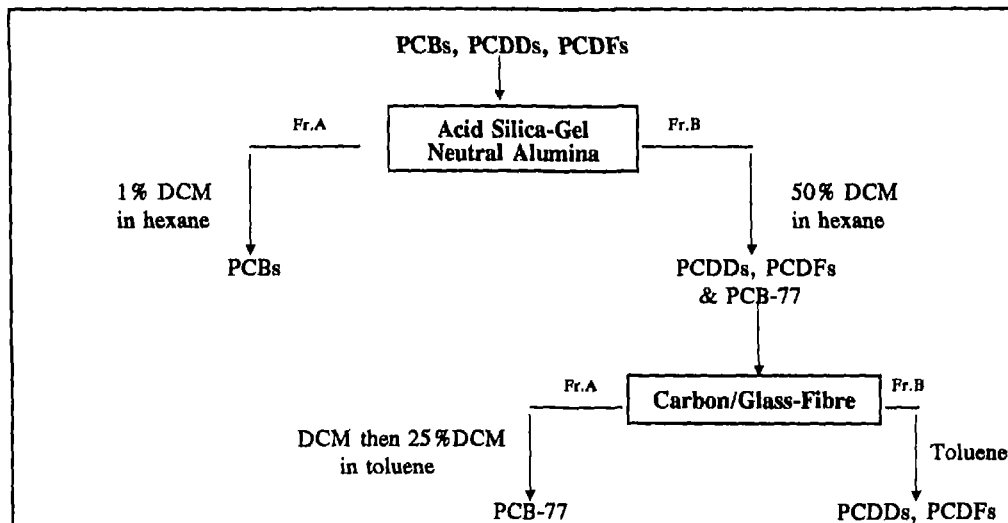
ELI Eco Logic International Inc.,

143 Dennis Street, Rockwood, Ontario, Canada N0B 2K0

During recent years, quick and effective sample clean-up and fractionation methods for the isolation of congener-specific PCBs have been developed.<sup>1</sup> These developments are becoming increasingly important considering the difficulty in the GC/MS analysis for 2,3,7,8-T<sub>4</sub>CDD in the presence of PCBs.<sup>2</sup>

A routine method for the exclusive separation and isolation of PCBs and PCDDs/PCDFs at the congener-specific level within the same matrix has now been established. Method spikes containing thirteen PCB congeners, in varying degrees of coplanarity including the non-ortho substituted PCB-77, -126 and -169, thirteen PCDD congeners including 2,3,7,8-T<sub>4</sub>CDD, and ten PCDF congeners were subjected to a clean-up of acid silica-gel over neutral alumina. Elution with 1% methylene chloride (DCM) in hexane provided a fraction A containing all PCB congeners excluding PCB-77 and totally void of PCDDs and PCDFs. Subsequent elution with 50% DCM in hexane provided a fraction containing all PCDDs and PCDFs in addition to >90% of the total PCB-77 response. Subjecting fraction B to carbon/glass fibre clean-up (elution with DCM then 25% DCM in toluene) allowed for exclusive separation of PCB-77 (>99%) from the PCDD and PCDF fraction (toluene elution).

This method has an important application in PCB transformer fires where the analysis for PCDDs is indicated. This laboratory is currently involved in the application of this technique toward the analysis of human whole blood.



1 Wilson-Yang, K.M. Power, J.P., Chisholm, E.A. and Hallett, D.H. *The Congener-Specific Determination of PCBs: Carbon Column Chromatography of Potentially Toxic Congeners*, *Chemosphere*, 23 (8-10), 1139-1143, 1991.

2 Naikwadi, K.P. and Karasek, F.W. *Gas chromatograph separation of 2,3,7,8-tetrachlorodibenzo-p-dioxin from polychlorinated biphenyl and tetrachlorodibenzo-p-dioxin isomers using a polymeric liquid crystal capillary column.*

