

## IMPACT OF SOIL DEPTH ON THE DISSIPATION OF CHLOROBENZENES

Ekemah, C. E. \*, E. J. Shaw and C. D. Collins

Department of Soil Science, University of Reading, Reading, RG6 6DW, United Kingdom.

### ABSTRACT

*The fate processes of volatilization and biodegradation were quantified in an aerobic batch experiment for the chlorobenzenes (CBs): 1,2-dichlorobenzene (DCB), 1,2,3-trichlorobenzene (TCB) and hexachlorobenzene (HCB) in soil sampled from different depths: topsoil (0-5 cm) and subsoil (80-100 cm) of a soil profile. Sterilized and unsterilized soils with soil organic carbon content of 0.41% for the subsoil and 1.58% for the topsoil were incubated in a microcosm chamber with the spiked chlorobenzenes for 120 days. The data regarding the depletion of the chlorobenzenes suggest that the lower chlorinated benzenes (DCB and TCB) were depleted relatively quickly compared to the higher chlorinated HCB, with DCB being the first to be reduced to undetectable level in the unsterilized soil. In addition volatilization was the main mechanism for the loss of the chlorobenzenes in soil, with more volatilization losses on the subsoil relative to the topsoil for 1, 2-DCB and 1,2,3-TCB, which may be explained by the higher organic carbon on the topsoil than on the subsoil. HCB volatilization losses however did not vary with soil depth and lasted till the end of the incubation period. It is likely that the strong binding to soil of the more hydrophobic HCB was responsible for its stronger retention across depths. This therefore indicates higher risk of persistence of HCB in the soil.*

**Keywords:** chlorobenzenes, volatilization, biodegradation, topsoil, subsoil.

\*Corresponding author: [c.e.ekemah@reading.ac.uk](mailto:c.e.ekemah@reading.ac.uk).

**Received:** 2012/02/02

**Accepted:** 2012/02/11