

Determination of physical coefficients for monoterpenoids and monoterpene uptake in *Quercus Ilex*

The main focus of our work were determination of coefficients between water phase and organic phase (octanol – water partition coefficient) and between air phases and water phases (Henry Law Constant) for monoterpenoids and temperature dependence of its. Their coefficients were used for model analysis of the effects of non-specific monoterpene storage in leaf tissues.

As equilibrium constants, the temperature dependence of partition coefficient and HLC have been found to be adequately modelled in many cases by van't Hoff equation, express thermodynamically as follows:

$$\ln H(\text{or } K_{ow}) = \frac{\Delta S}{R} - \frac{\Delta H}{R} \left(\frac{1}{T} \right)$$

where R is universal gas constant (0.00831 kJ mol⁻¹K⁻¹), ΔH = enthalpy of volatilisation or solvation (kJ mol⁻¹), ΔS = entropy of volatilisation or solvation (kJ mol⁻¹) and T = temperature (Kelvin). This equation is valid only for a limited temperature range, such as the ambient range seen for normal environmental conditions.

We used shake flask method based on the OECD Test Guideline for the K_{OW} determination for monoterpenoids. We used Gas Chromatograph method (HP 5938 II Gas Chromatograph) for the concentration of monoterpenoids determination in the octanol and in the water phases. Experimental data were compared with estimated data.

The method for determination of Henry Law Constant was EPICS-method based on the determination of the concentration of monoterpenoids of headspace in the vial using a HP 5938 II Gas Chromatograph. The liquid-gas partition coefficient of a solute can be extrapolated within a reasonable range to other temperatures.

We use PTR-MS to investigate the emission and uptake of total monoterpene from *Quercus ilex*. Leaf pieces floated on fosmidomycin lose the ability to make monoterpene. If the inhibition of monoterpene were specific, fosmidomycin could provide a method of controlling the production of endogenous monoterpene while examining thermotolerance of photosynthesis and to see the uptake of monoterpene.

For photosynthetic rates and stomatal conductance measurements a portable porometer type CIRAS-2 (PPSystems, Hitchin, Hertfordshire, UK) with automated gas mixing and a Parkinson leaf chamber (Std Broad 2.5) was employed.