

INTERNAL DYNAMICS AND CHIRAL ANALYSIS OF PULEGONE, USING MICROWAVE BROADBAND SPECTROSCOPY

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Essential oils, such as peppermint or pennyroyal oil, are widely used in medicine, pharmacology and cosmetics. Their major constituents, terpenes, are mostly chiral molecules and thus may exhibit different biological functionality with respect to their enantiomers. Here, we present recent results on the enantiomers of pulegone, one of the components of the peppermint (*Mentha piperita* L.) and pennyroyal (*Mentha pulegium*) essential oils, using the microwave three-wave mixing (M3WM) technique.

M3WM relies on the fact that the scalar triple product of the dipole moment components μ_a , μ_b and μ_c differs in sign between the enantiomers. A loop of three dipole-allowed rotational transitions is required for the analysis of a chiral molecule. Since the recorded signal will be exactly out of phase for the two enantiomers, an unambiguous differentiation between them is possible, even in complex mixtures.

In addition to the chiral analysis of pulegone, its internal dynamics, resulting from the independent rotation of two of its three methyl groups, will be discussed. Moreover, a cluster of pulegone with one water molecule will be presented.