Tastant Interactions with Model Membranes

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by

PATRICIA SHAW

Department of Chemistry
University of Auckland

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ABSTRACT

A wide range of compounds elicit the sweet taste response but currently it is not known what causes this response.

In Chapter 3 a number of sweeteners, and representatives of all the taste groups are investigated using NMR spectroscopy. The T_1 relaxation times of the tastants were determined in aqueous solution and in solution with liposomes, a model membrane system. The observed changes in T_1 values are analysed to determine which regions of the tastants are involved in the interaction with the membrane.

In Chapters 4 and 5 an investigation is reported of the interaction of tastants with a liquid membrane system, which is reportedly able to distinguish between classes of chemicals. The interest lies in developing a simple experiment that will enable taste qualities to be predicted, something that is currently not possible.

In Chapters 6 and 7 the NMR assignments of some sweeteners is discussed. NMR assignments are a necessary precursor before their sweetening properties can be studied by NMR.

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Abbreviations

ADC	analogue-to-digital converter
ax	axial
BLM	black-lipid-membrane
COLOC	correlation spectroscopy *via* long range couplings
COSY	correlation spectroscopy
CTAB	hexadecyltrimethylammonium bromide
$\delta(^{13}C)$	^{13}C chemical shift
$\delta(^{1}H)$	^{1}H chemical shift
da	dalton
DEPT	distortionless enhancement by polarisation transfer
DQF	double quantum filtered
DSS	sodium-2,2-dimethyl-2-silapentane-5-sulfonate
eq	equatorial
FLOCK	long-range ^{13}C-^{1}H correlation spectrum
INAPT	insensitive nuclei assigned by polarisation transfer
J	coupling constant
LB	Langmuir-Blodgett
LUV	large unilamellar vesicle
MLV	multi lamellar vesicle
NMR	nuclear magnetic resonance
NOE	nuclear Overhauser effect
PAGE	polyacrylamide gel electrophoresis
PC	phosphatidylcholine
ppm	parts per million
SDS	sodium dodecyl sulphate
SUV	small unilamellar vesicle