



Comprehensive gas chromatography (GCxGC) with optional pre-fractionation into saturated & aromatic hydrocarbons via HPLC

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Method description in brief

The sample extracts are analysed via comprehensive gas chromatography (GCxGC).

Injection: PTV on-column

Columns: Reversed setup

(1st dimension: mid-polar, 2nd dim.: apolar)

Modulation: Cryogenic

Detection: FID or MS

The GCxGC is increasing the separation power by a second dimension. This enables a chromatographic separation of hydrocarbon subgroups. A quantification can be performed via FID with internal standards (one point calibration for target and non-target screenings) instead of conventional calibration. An identification of separated single substances and subgroups can be performed via TOF-MS.

Previous to GCxGC, a HPLC fractionation can be performed to separate saturated and aromatic hydrocarbons (MOSH/MOAH methodology). Additionally, the HPLC fractionation enables a clean-up for matrix components (e.g. triglycerides) in environmental and food samples.

Applicability of method

Carbon number: C8 – C40 (*n*C8 – *n*C50)

Internal Standards (**IS**) with negligible coelution

Saturated hydrocarbons:

iso-Alkanes & n-alkanes (**n-/iso-P**)

Monocyclo-alkanes (**N**)

Dicyclo-alkanes (**DN**)

Tricyclo-alkanes (**TN**)

Aromatic hydrocarbons:

Monoaromatics (**MoAr**)

Naphthenic Monoaromatics (**NMoAr**)

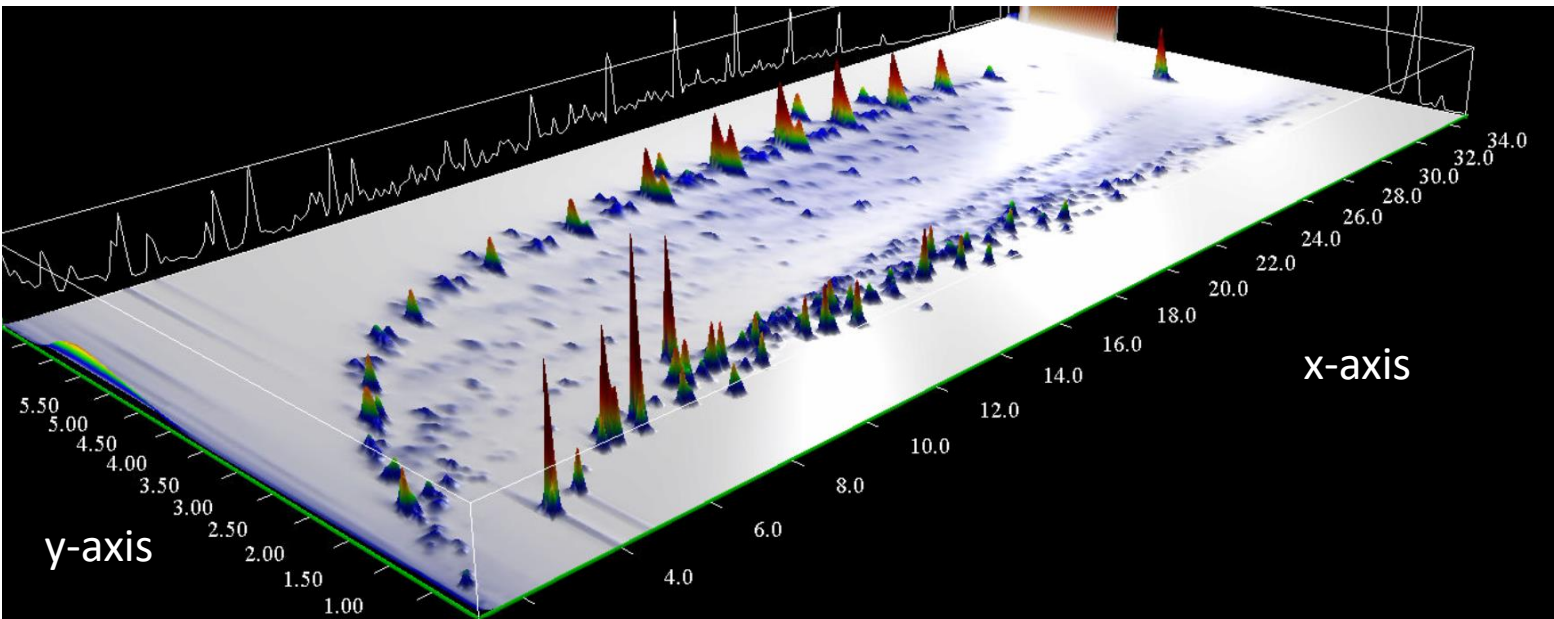
Diaromatics (**DiAr**)

Naphthenic Diaromatics (**NDiAr**)

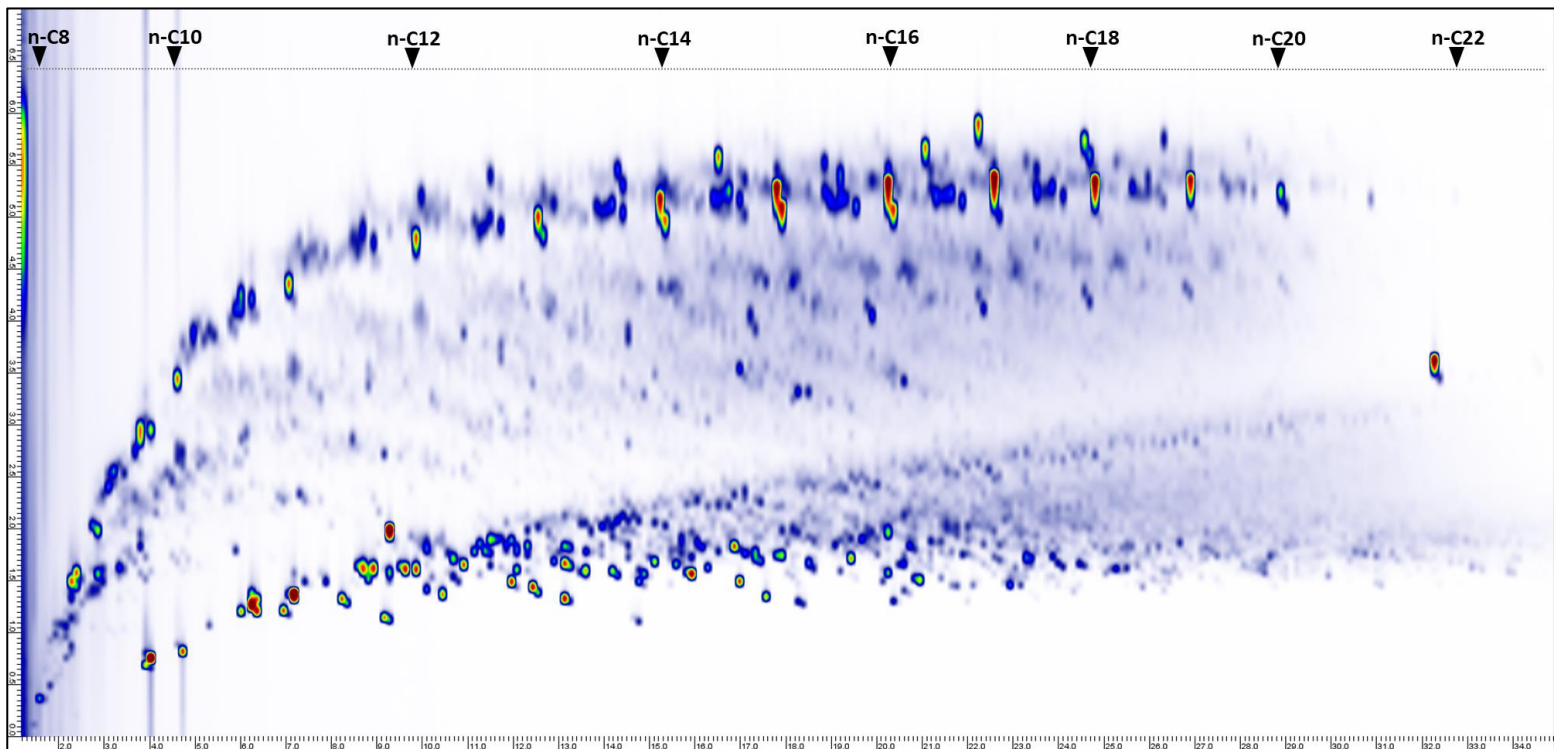
Triaromatics (**TriAr**)

Tetraaromatics (**TetAr**)

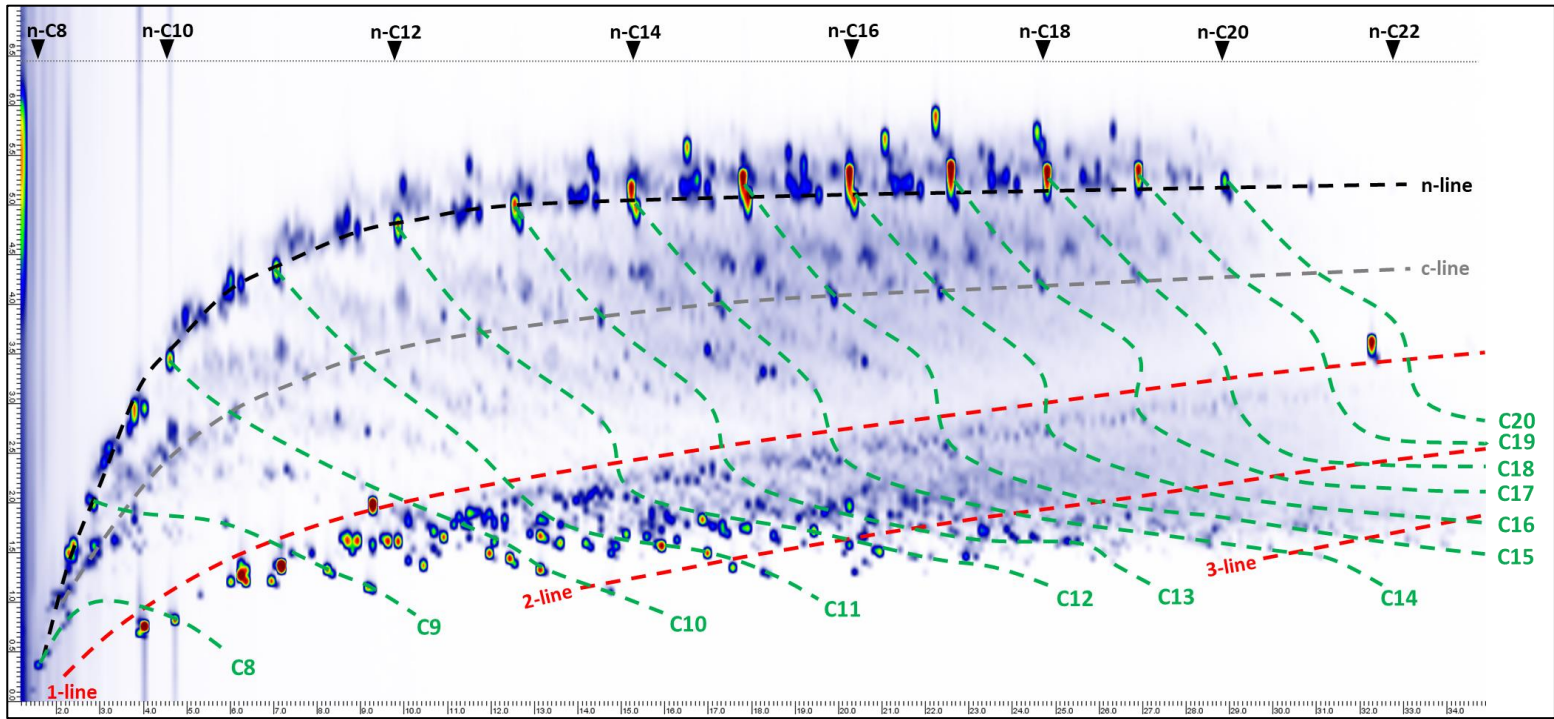
3D GCxGC plot:



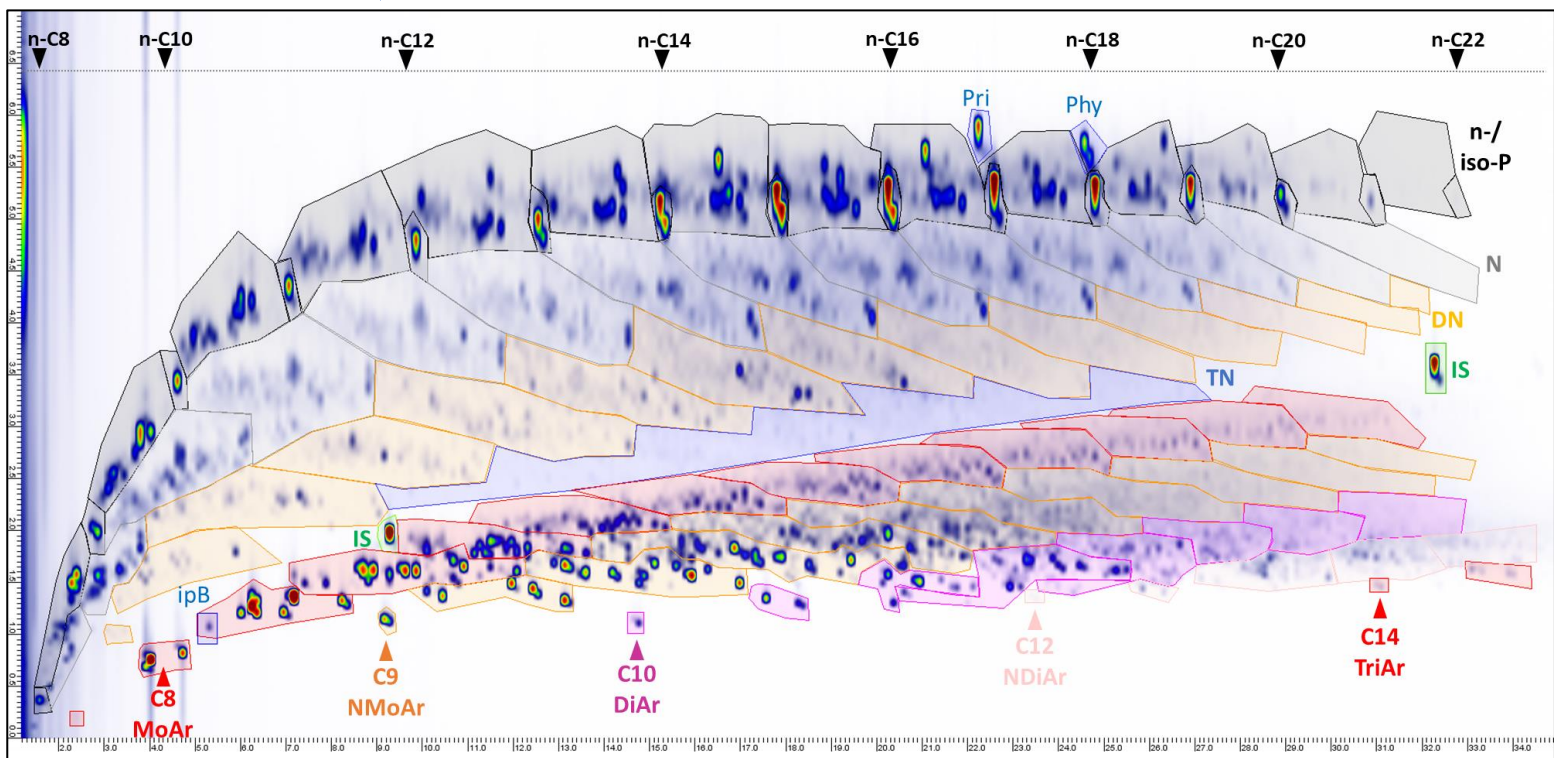
2D GCxGC plot:



2D Orientation



FID Quantification



#	n-P	Iso-P	N	DN	MoAr	NMoAr	DiAr	NDiAr	TriAr	TN	Total
C8	0.178	0.367	0.391	0.020	1.174						2.13
C9	0.352	1.249	0.879	0.274	3.279	0.253					6.29
C10	0.407	1.657	1.268	0.487	2.983	1.280	0.041				8.12
C11	0.509	1.543	1.230	0.485	1.840	2.318	0.220				8.15
C12	0.616	1.405	1.087	0.754	1.168	2.493	0.498	0.003			8.02
C13	0.880	1.593	1.445	1.007	0.886	1.938	1.074	0.028			8.85
C14	1.411	1.788	1.925	1.836	0.945	1.590	0.717	0.315	0.014		10.54
C15	2.098	2.685	2.444	1.529	0.911	1.441	0.647	0.341	0.045		12.14
C16	2.147	2.494	2.305	1.166	0.802	1.300	0.525	0.226			10.96
C17	1.844	2.387	2.243	0.935	0.673	0.794	0.413				9.29
C18	1.405	1.745	1.788	0.693	0.551	0.545					6.73
C19	0.966	1.910	1.129	0.315	0.359	0.231					4.91
C20	0.334	1.262	0.408	0.061							2.06
C21	0.041	0.185	0.081	0.005							0.31
C22	0.003	0.027									0.03
C23											0.00
Total	13.19	22.30	18.62	9.57	15.57	14.18	4.14	0.91	0.06	1.46	100.00

[%]