Bundesamt für
Verbraucherschutz und
Lebensmittelsicherheit

Analysis of solvent naphtha formulants in plant protection products

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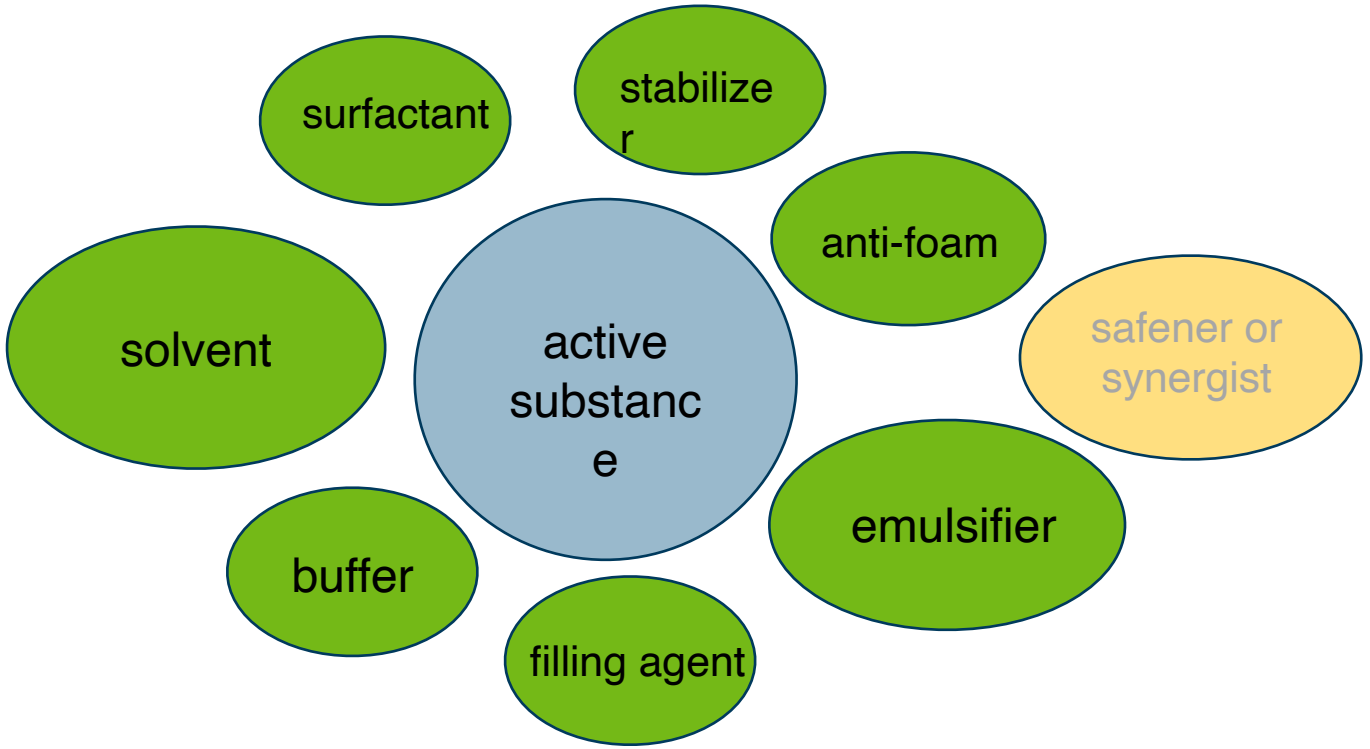
Plant Protection Products – composition

A plant protection products consists of

- one or more active ingredients
- a safener or synergist
- co-formulants, consisting of one or more co-formulant substances



Authorisation of PPPs in Europe

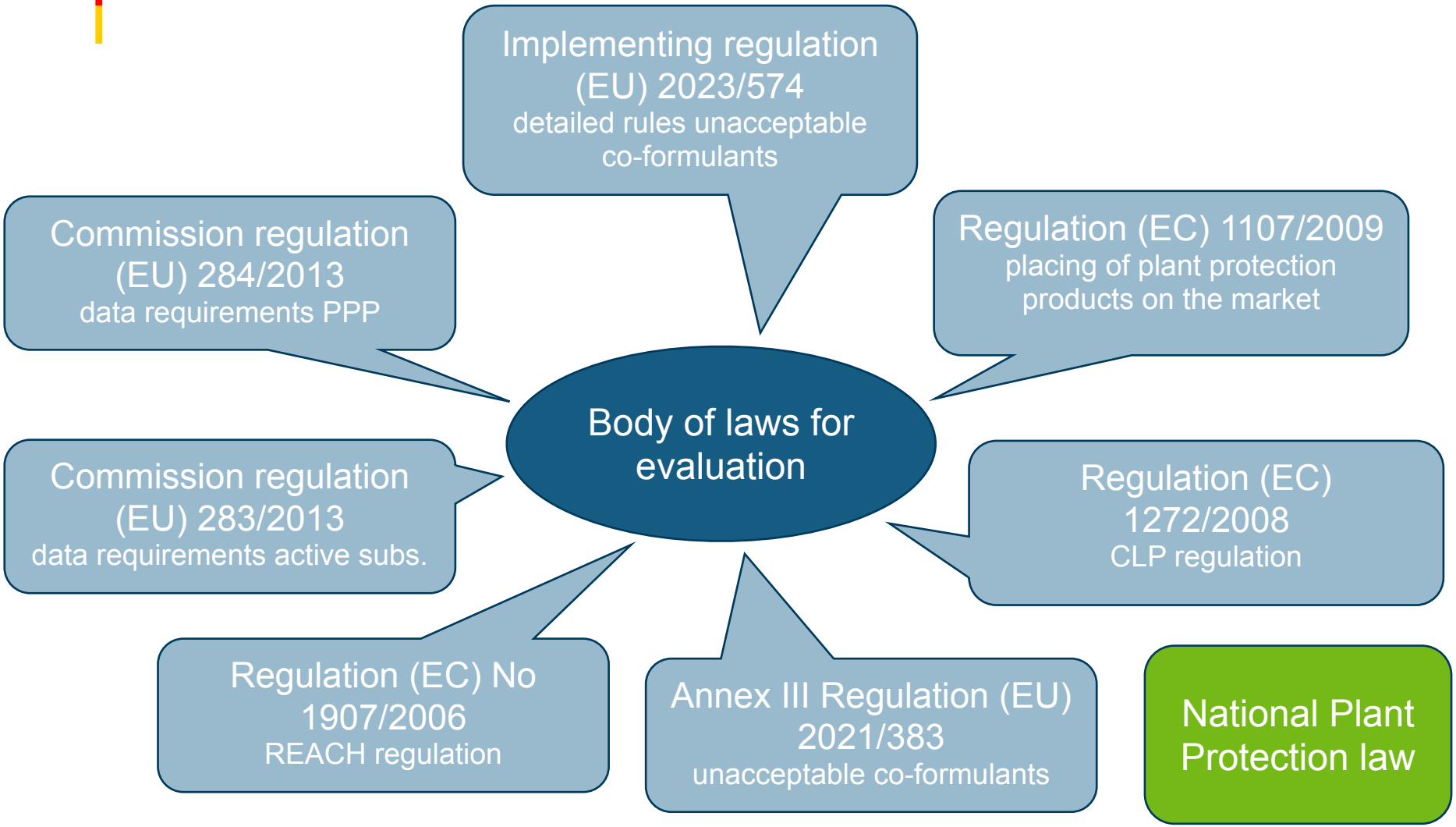
History

- before 1970: authorisation only on national level
- 1978: Council Directive 79/117/EEC of the European Economic Community
  first ban of definite substances in PPPs
    - mercuric(organic) substances, persistent organic chlorine compounds

  → implementation in national law: Plant protection use regulation (DE)
- 1991: Council Directive 91/414/EEC concerning the placing of plant protection products on the market
- Before 2009 only in special cases requirements for co-formulants,
  e.g., tallow amines and NPE
- 2009: Regulation (EC) No 1107/2009
  repealing both Council Directives of EEC

  → explicit requirements also for co-formulants, e.g., annex III

Evaluation – Body of laws



Unacceptable co-formulants– Annex III of Reg. (EG) 1107/2009

Article 27

(1) A co-formulant shall not be accepted for inclusion in a plant protection product where it has been established that:

(a) its residues, consequent on application consistent with good plant protection practice, and having regard to realistic conditions of use, have a harmful effect on human or animal health or on groundwater or an unacceptable effect on the environment; or

(b) its use, consequent on application consistent with good plant protection practice and having regard to realistic conditions of use, has a harmful effect on human or animal health or an unacceptable effect on plants, plant products or the environment.

Unacceptable co-formulants– Annex III of Reg. (EG) 1107/2009

Cut off criteria for co-formulants

CLP Reg. 1272/2008	REACH Reg. 1907/2006	Reg. 850/2004
carcinogen cat. 1A/1B mutagen cat. 1A/1B toxiccarcinogen to reproduction cat. 1A /1B	(very) persistent (very) bioaccumulative toxic (PBT/ VPvB) endocrine disruptors	persistent organic pollutants (POP)

- narrow 2000 different co-formulants in authorised PPPs
- currently **144** entries in the list of unacceptable co-formulants (Annex III)

Solvent naphtha co-formulants

Use

- solvent
- surfactant
- emulsifier
- mostly in suspension concentrates, emulsion concentrates

- Production via fractional mineral oil distillation
- Differentiation via boiling point areas

example:

Solvesso 100:	bp 154 °C – 174 °C	(**C_9**, C_{10})
Solvesso 150:	bp 175 °C – 200 °C	(**C_{10}**, C_9)
Solvesso 200:	bp above 200 °C	(**C_{11}**, **C_{12}**, C_{13}, C_{14})

Trade names, examples

- Solvesso
- Hydrosol
- Shellsol
- Caromax

Solvent naphtha co-formulants - requirements

Development

Regulation (EC) No 1272/2008 (CLP)

- in force since 20.01.2009
- classification of naphthalene as carcinogen cat. 2
- labelling obligation at contents ≥ 1 %

Delegated regulation (EU) 692/2022

- in force since 23.11.2023
- amending of Regulation (EC) 1272/2008
- classification of cumene as carcinogen cat. 1B
- labelling obligation at contents ≥ 0,1 %

Solvent naphtha co-formulants - composition

Example boiling point 200 °C and higher

Without purification

- naphthalene < 10%
- cumene not listed

Naphthalene depleted

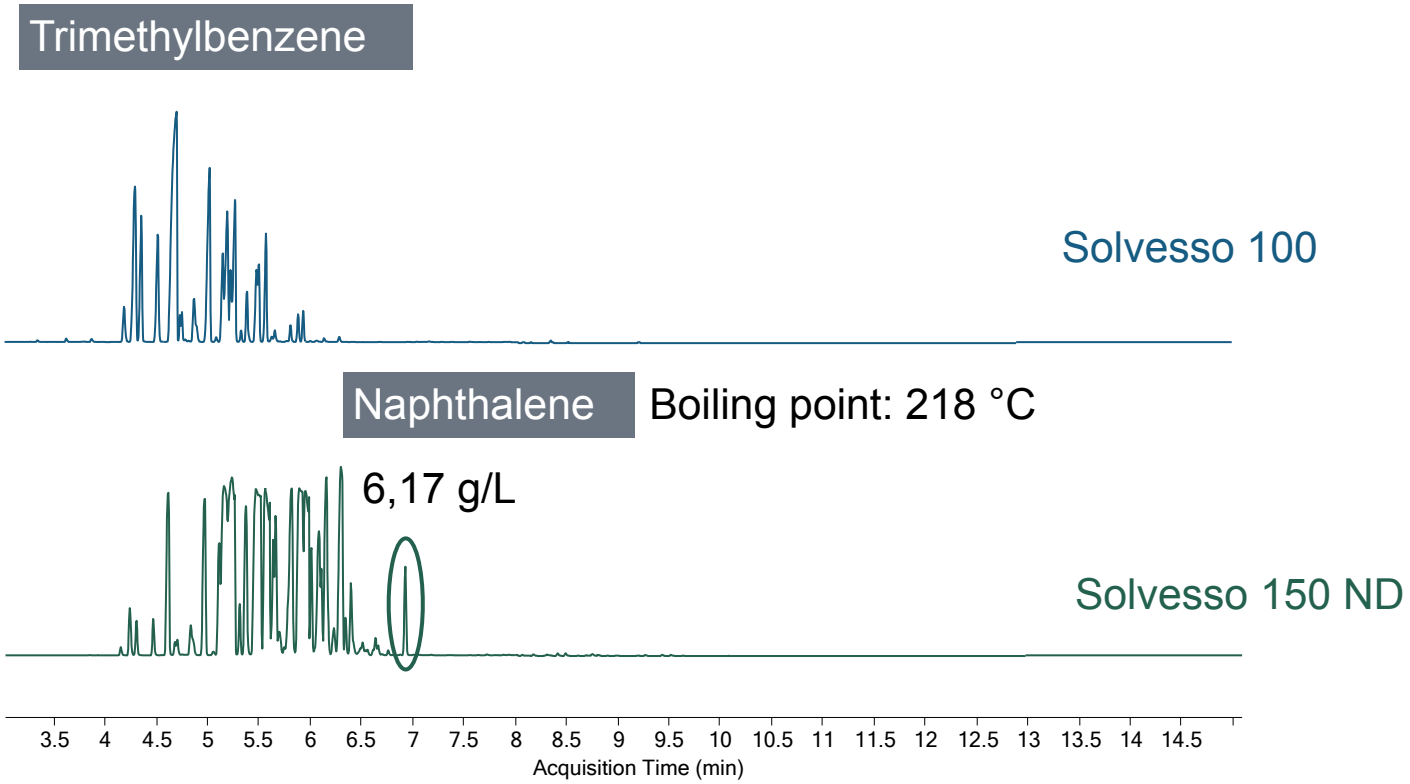
- naphthalene < 1%
- cumene not listed

Further purification (since 2023)

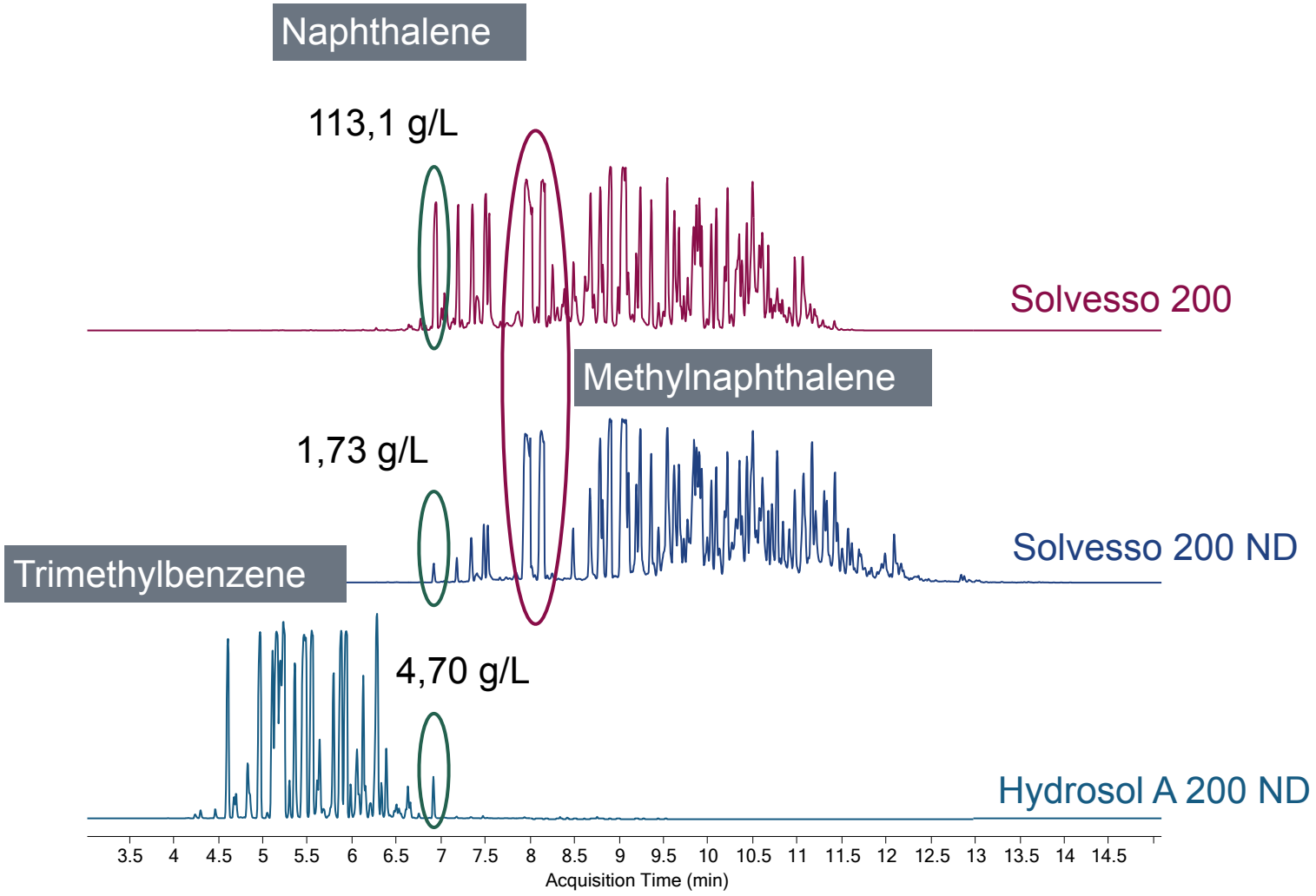
- naphthalene < 1%
- cumene < 0,0005%

Solvent naphtha co-formulants - 2014

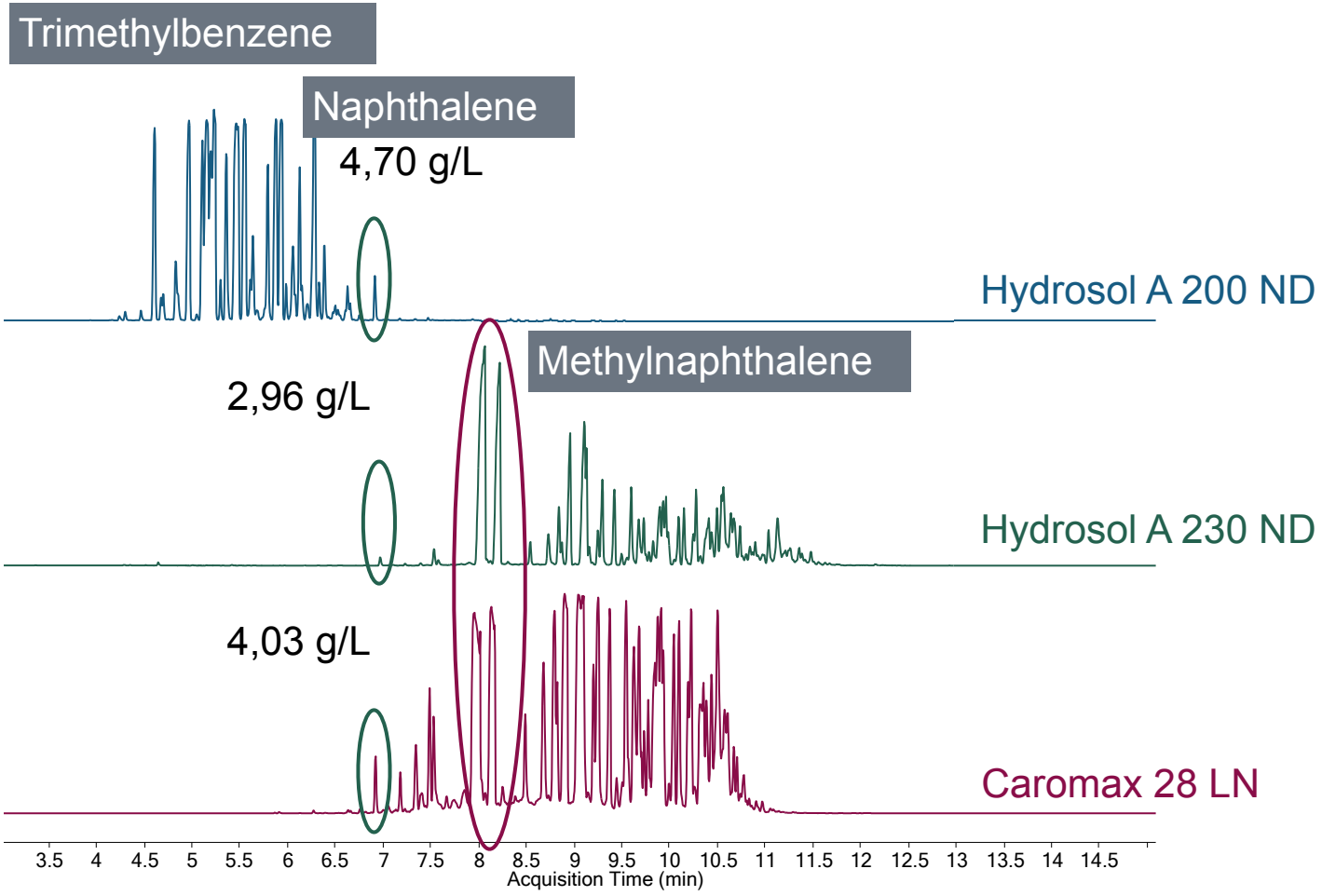
ND = Naphthalene-depleted



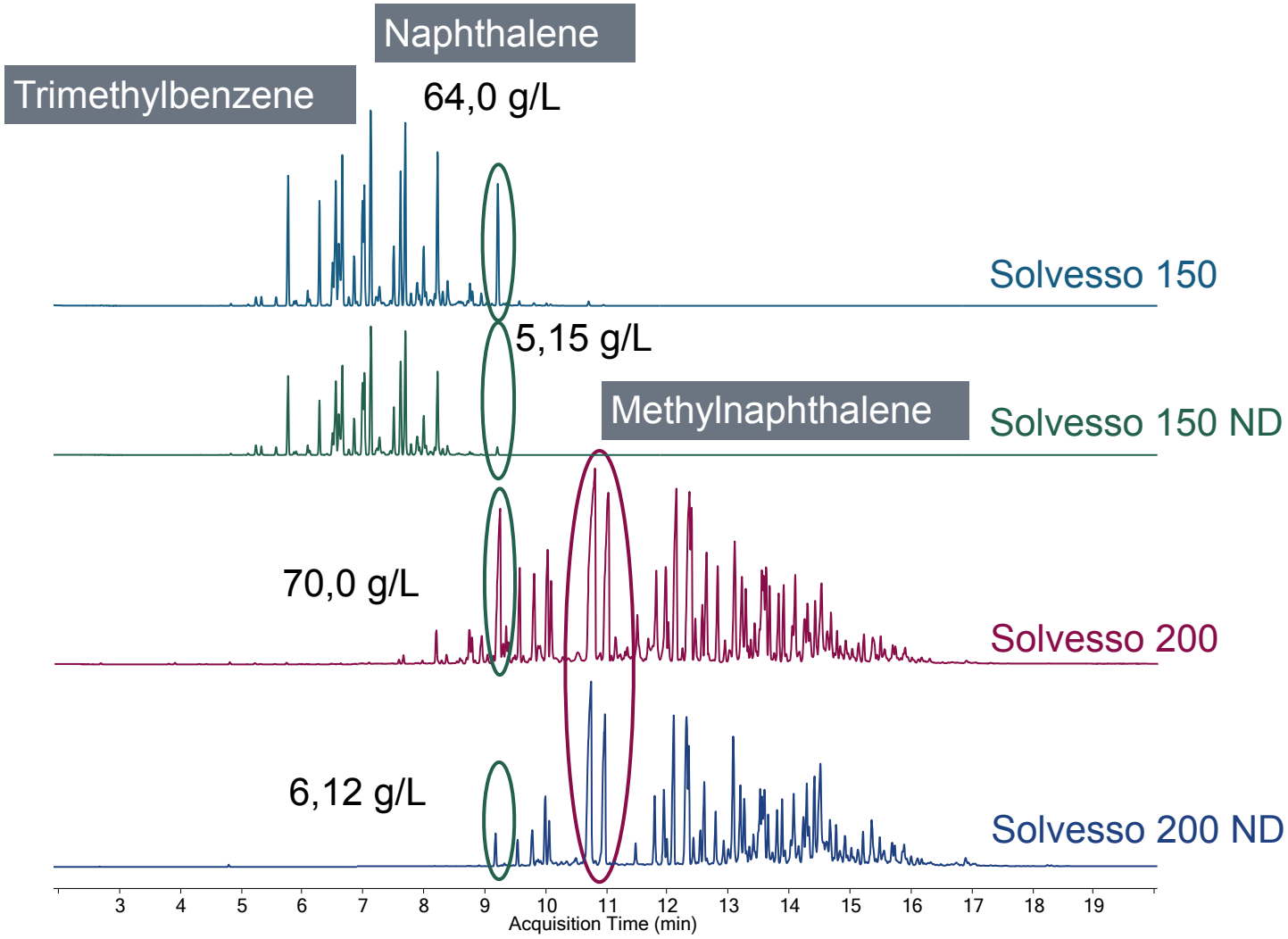
Solvent naphtha co-formulants - 2014



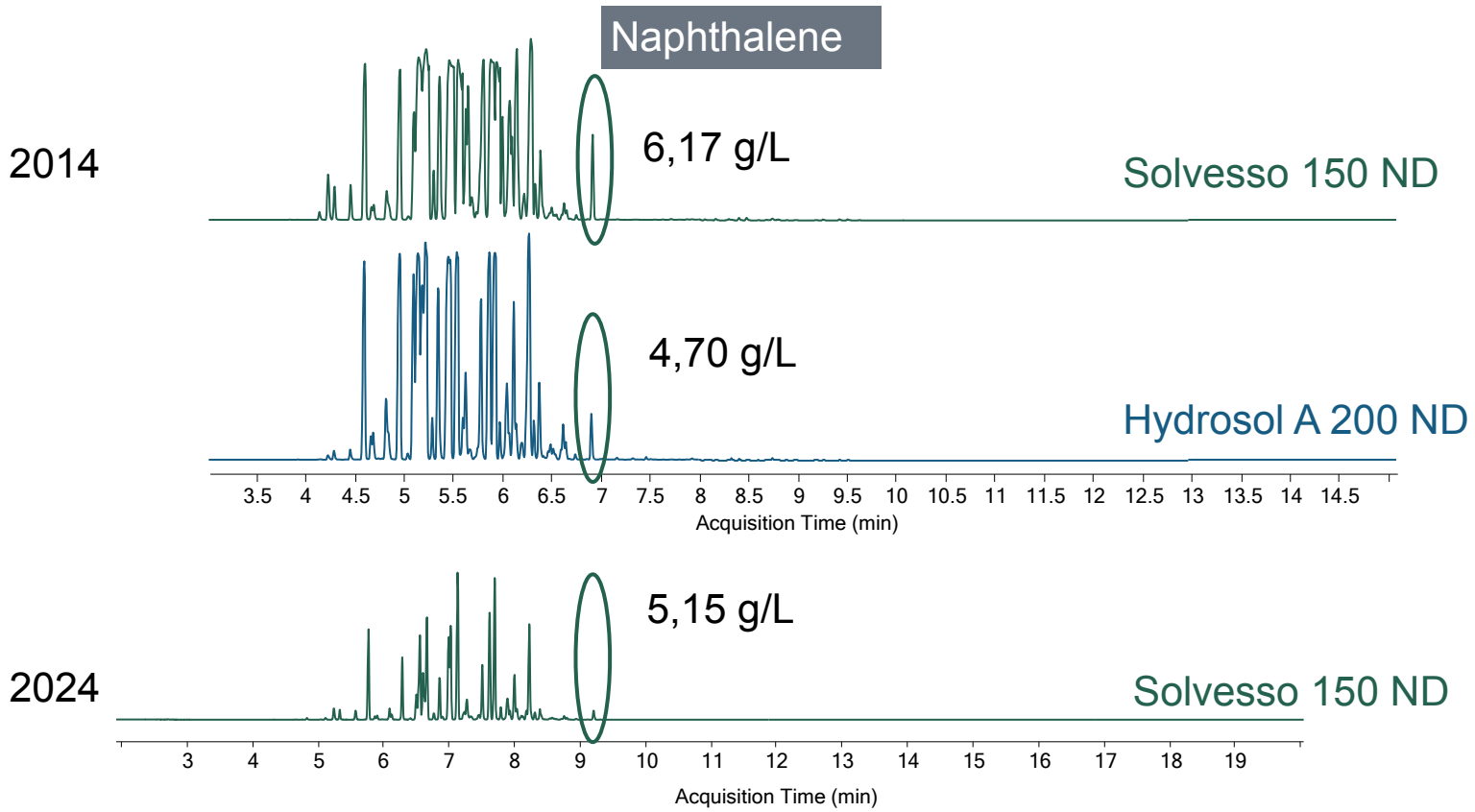
Solvent naphtha co-formulants - 2014



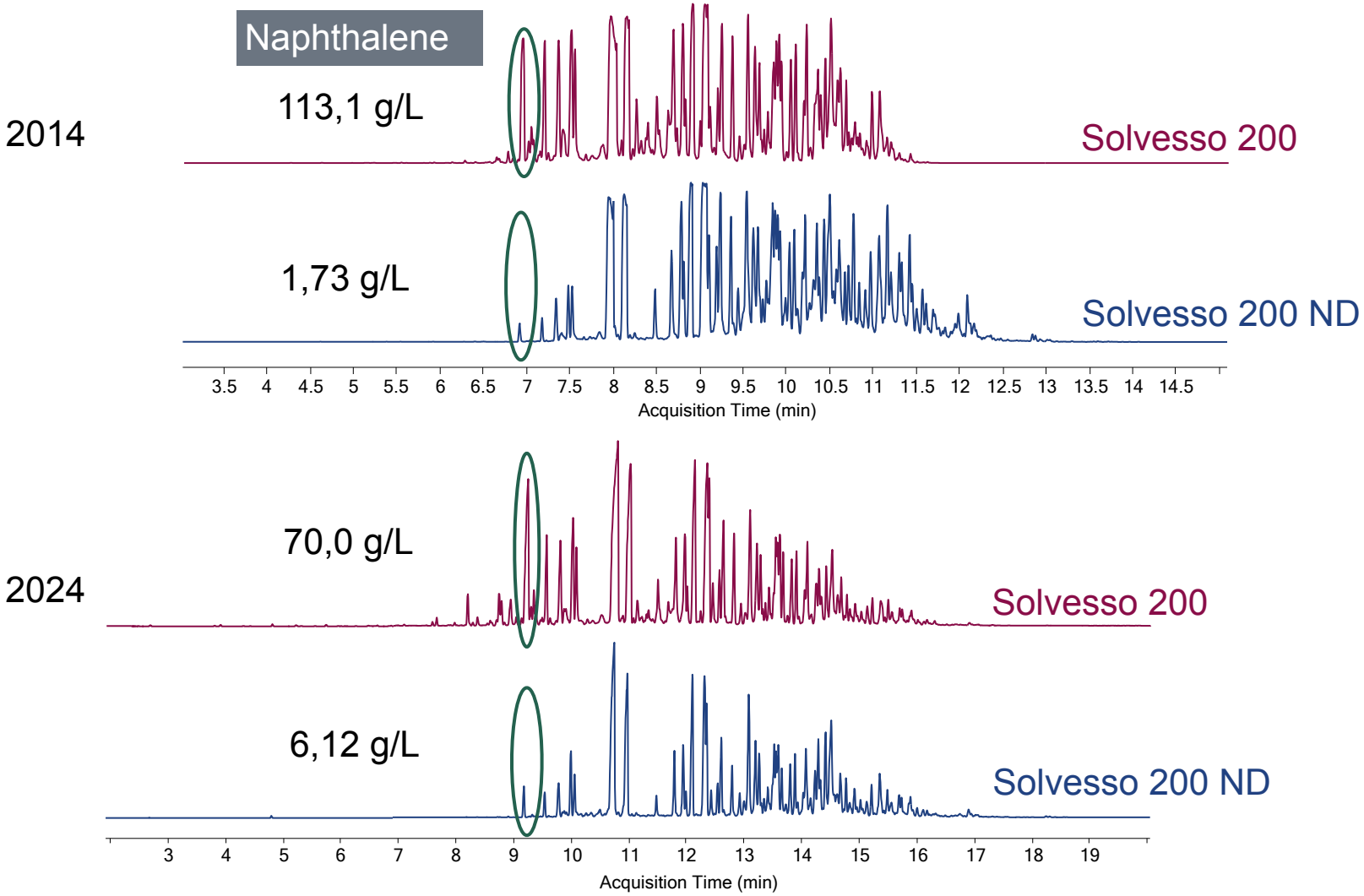
Solvent naphtha co-formulants - 2024



Solvent naphtha co-formulants - evolution



Solvent naphtha co-formulants - evolution



Solvent naphtha co-formulants - conclusion

- Requirements for co-formulants are growing over the years.
- Toxicological and/or ecotoxicological relevant co-formulant substances are not accepted anymore.
- In solvent naphtha co-formulants unwanted substances/impurities can be removed technical, e.g., by discarding fractions of concerned temperature.
- The composition of solvent naphtha co-formulants varies between the charges and over the time, but depending on the fraction differently intense.

Solvent naphtha co-formulants – future prospects

- Analysis of the 2024 solvent naphtha samples for cumene.
- To have an eye for further regulatory developments.
- Expand the capacities and method availabilities of control with respect to analyse unacceptable co-formulants.

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