



Bundesamt für  
Verbraucherschutz und  
Lebensmittelsicherheit



# **Analysis of solvent naphtha formulants in plant protection products**

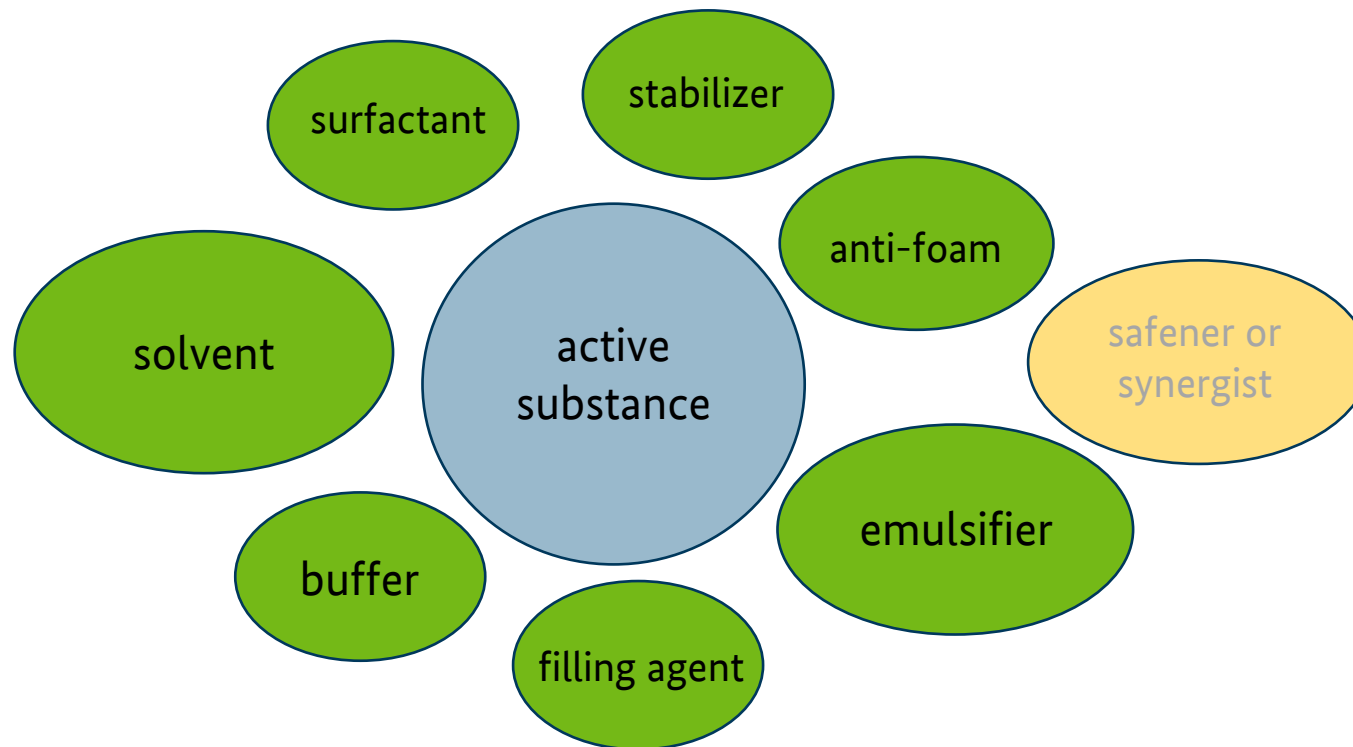
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# Plant Protection Products – composition

## 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



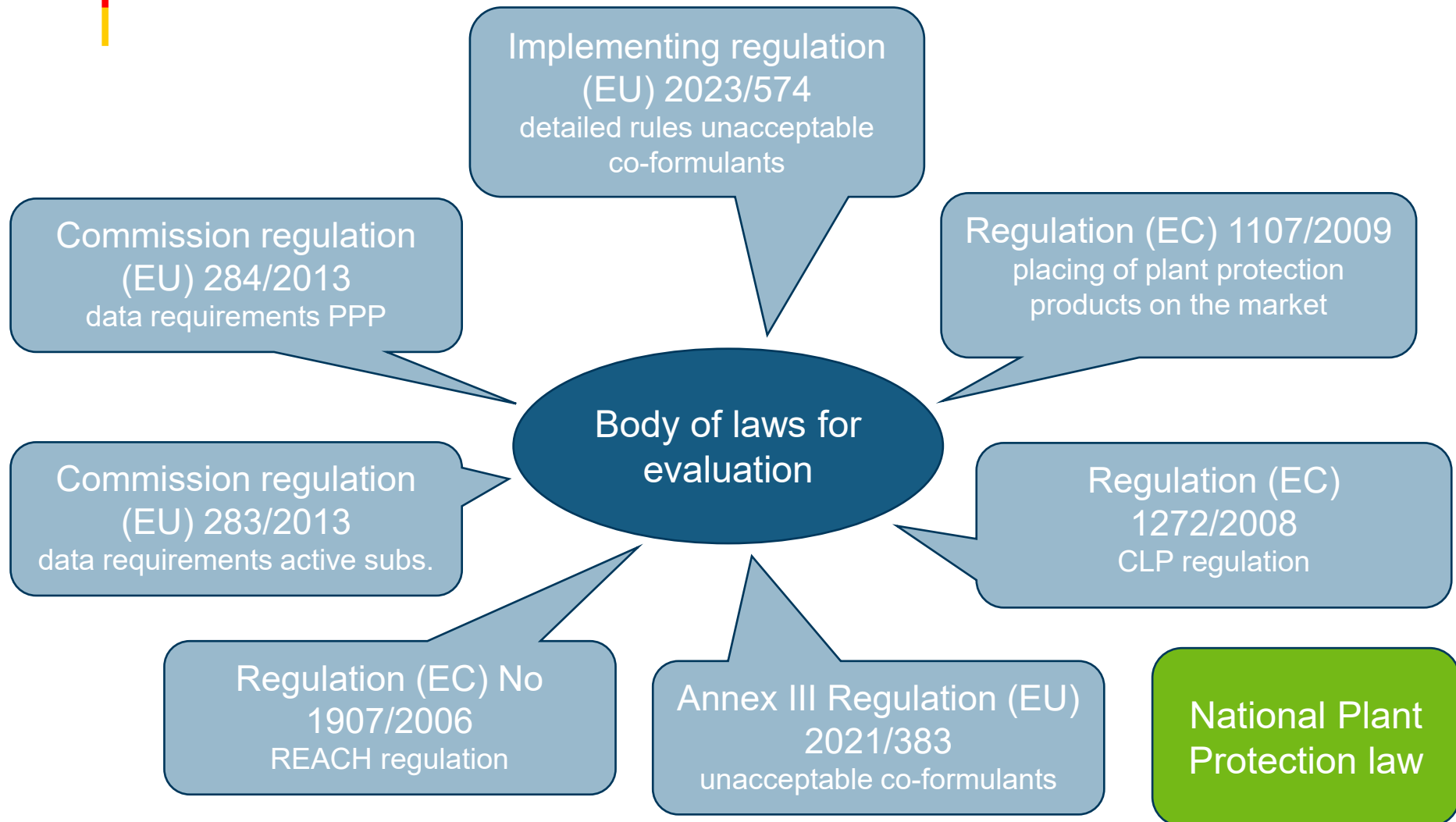


## History

- 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.<br>1272/2008   | REACH Reg.<br>1907/2006  | Reg. 850/2004                          |
|---|--|--|
| carcinogen cat. 1A/1B<br>mutagen cat. 1A/1B<br>toxic to reproduction<br>cat. 1A /1B | (very) persistent<br>(very) bio accumulative<br>toxic<br>(PBT/ VPvB)<br>endocrine disruptors | persistent organic<br>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

### Trade names, examples

- Solvesso
- Hydrosol
- Shellsol
- Caromax

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

example:

Solvesso 100: bp 154 °C – 174 °C (**C**<sub>9</sub>, C<sub>10</sub>)

Solvesso 150: bp 175 °C – 200 °C (**C**<sub>10</sub>, C<sub>9</sub>)

Solvesso 200: bp above 200 °C (**C**<sub>11</sub>, **C**<sub>12</sub>, C<sub>13</sub>, C<sub>14</sub>)



## Development

### Regulation (EC) No 1272/2008 (CLP)

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

### 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  $\geq 0.1$  %





## 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)

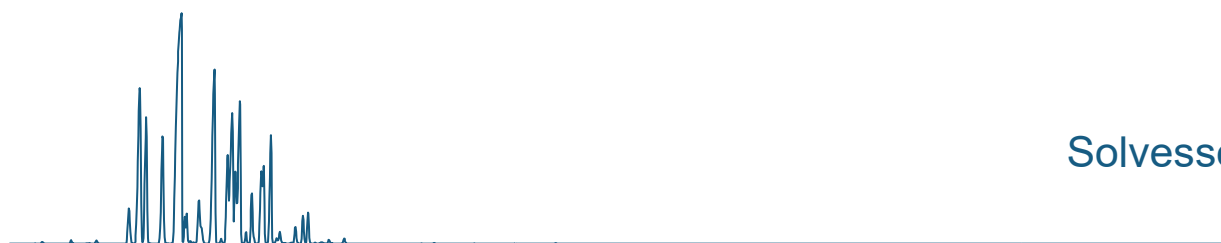
- naphthalene < 1%
- cumene < 0.0005%



# Solvent naphtha co-formulants - 2014

ND = Naphthalene-depleted

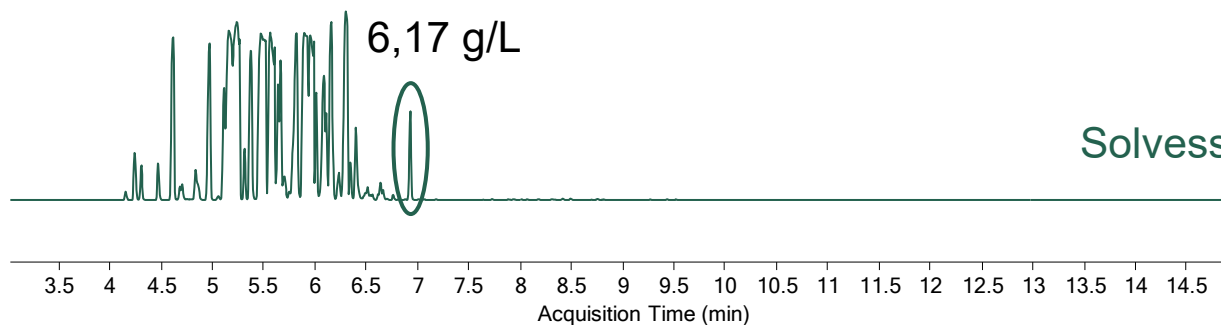
Trimethylbenzene



Solvesso 100

Naphthalene Boiling point: 218 ° C

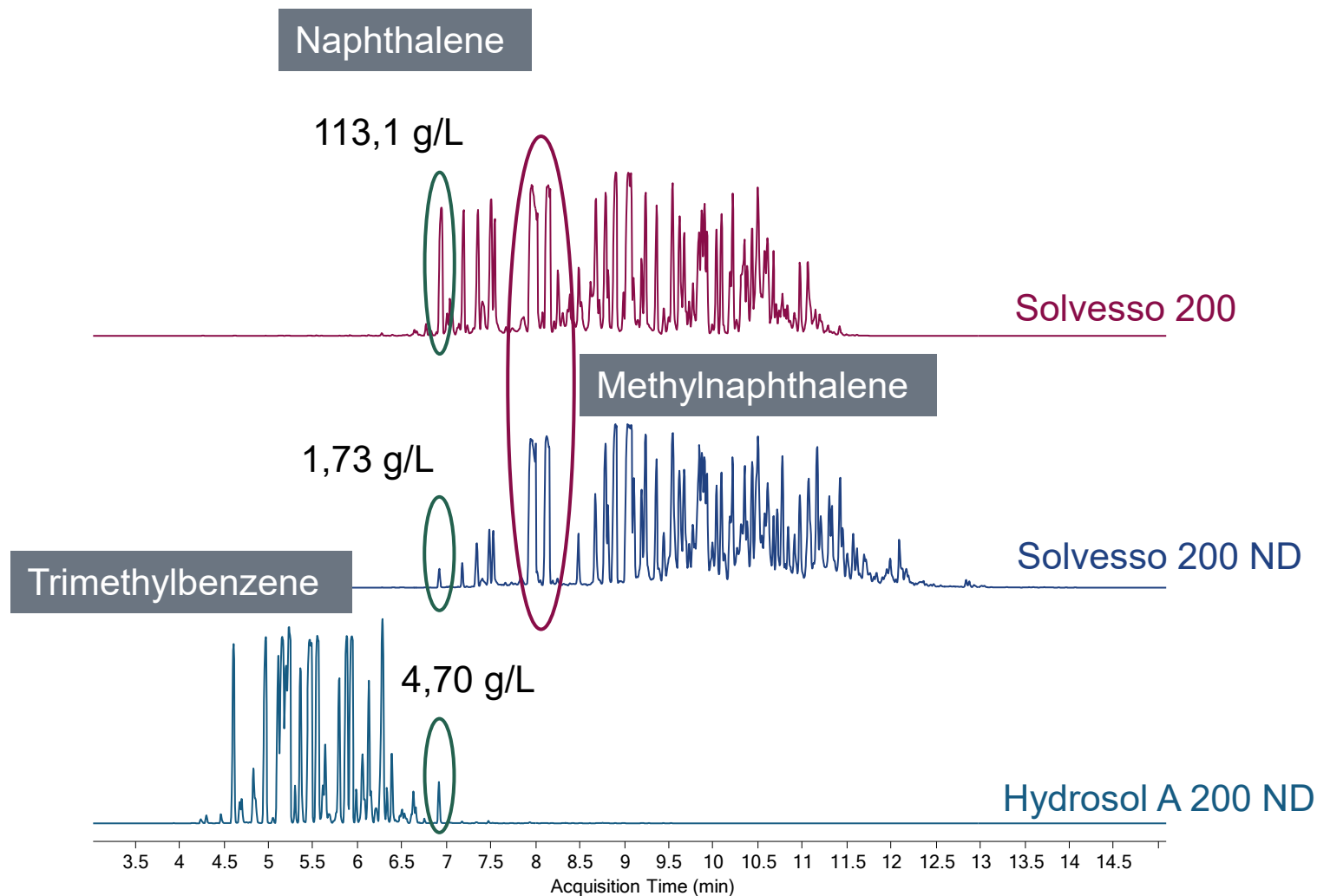
6,17 g/L



Solvesso 150 ND

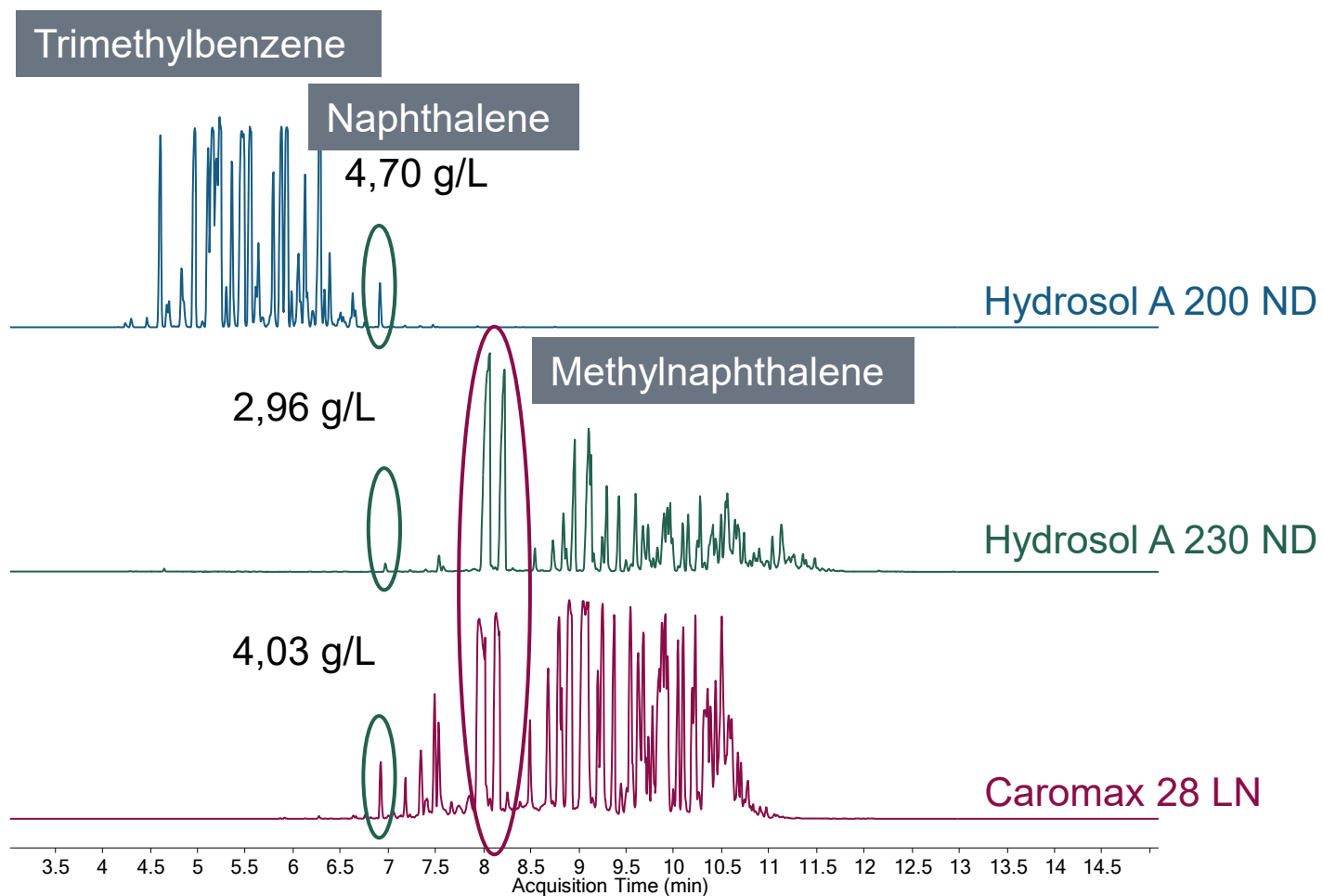


# Solvent naphtha co-formulants - 2014



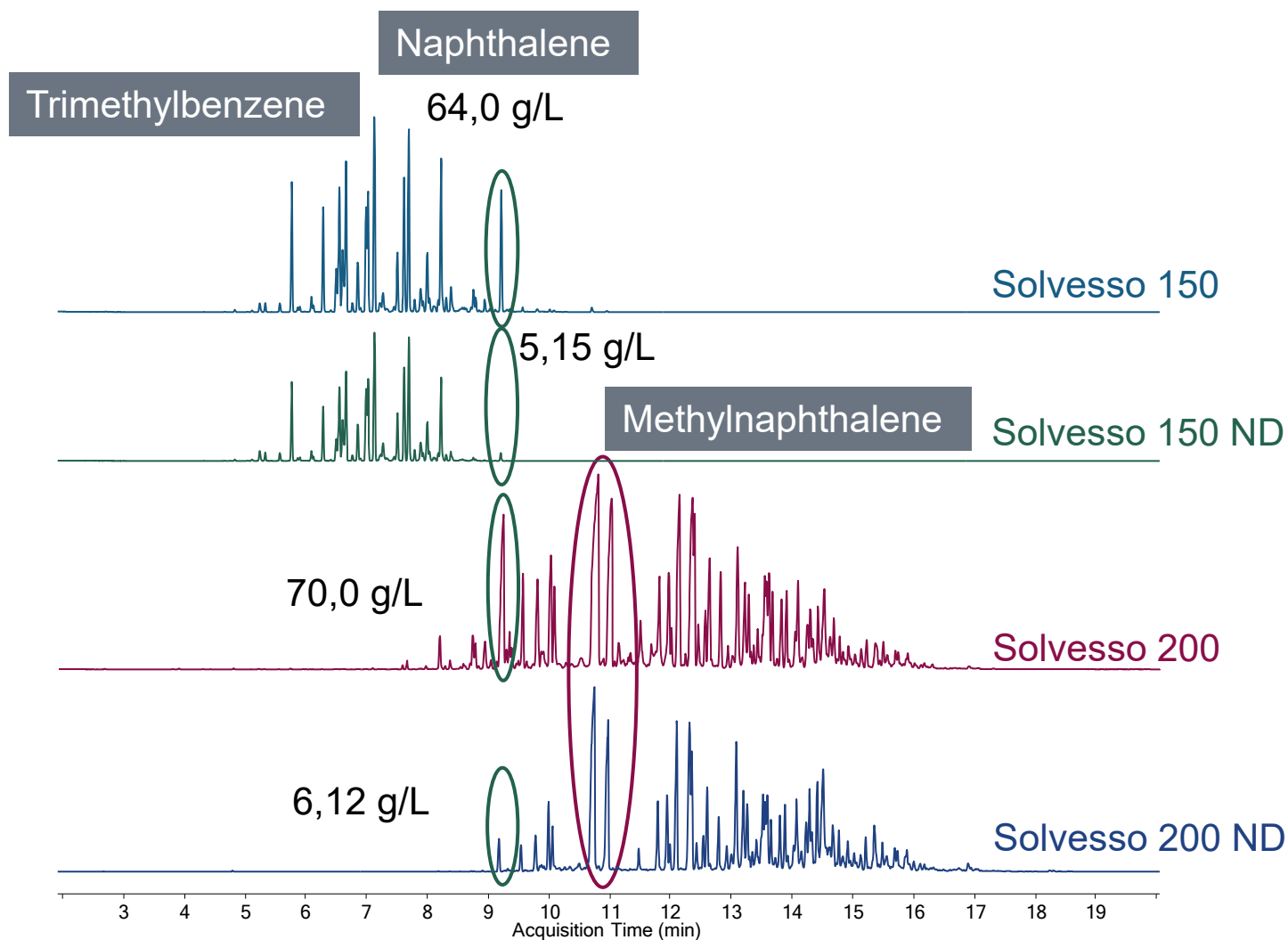


## Solvent naphtha co-formulants - 2014



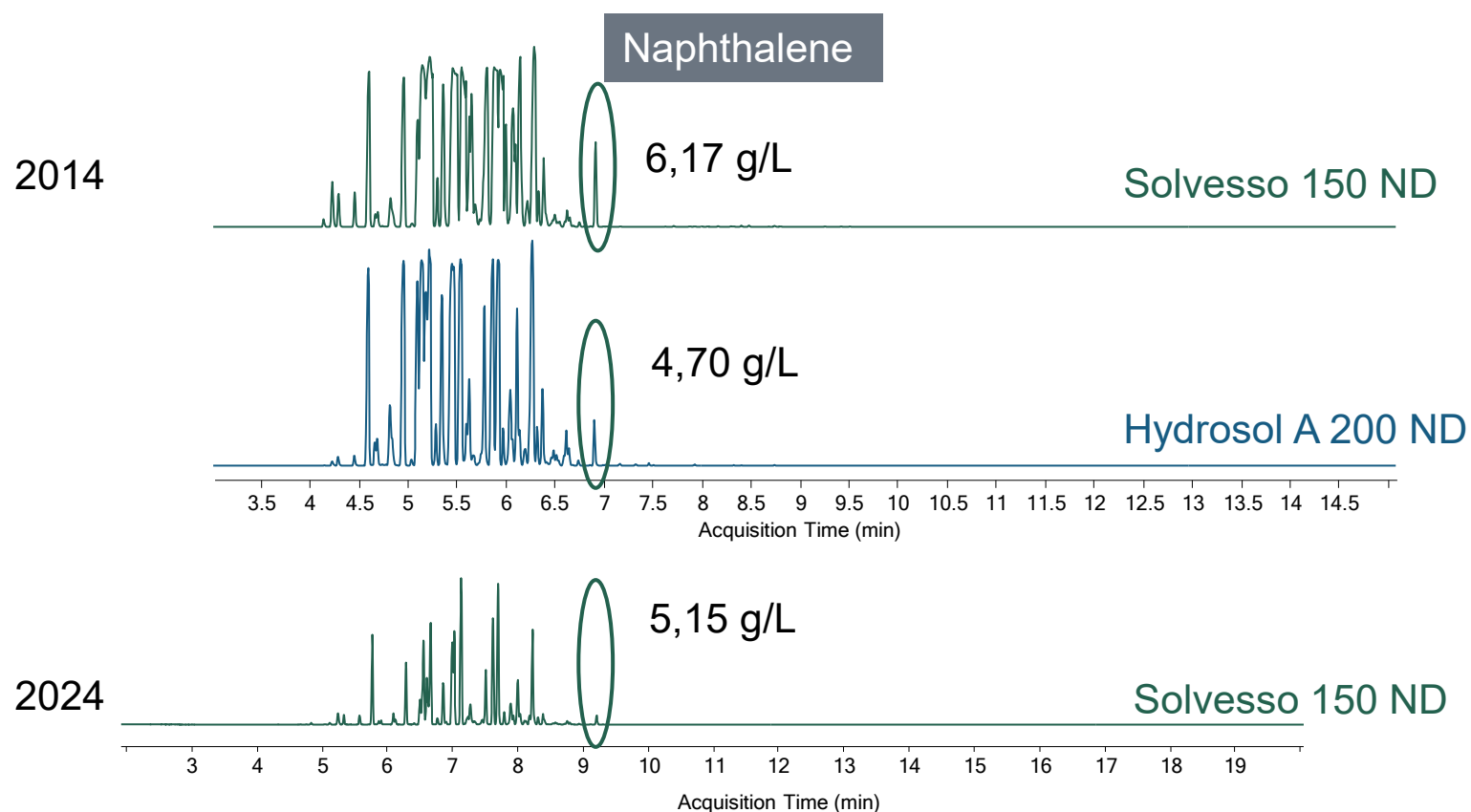


# Solvent naphtha co-formulants - 2024



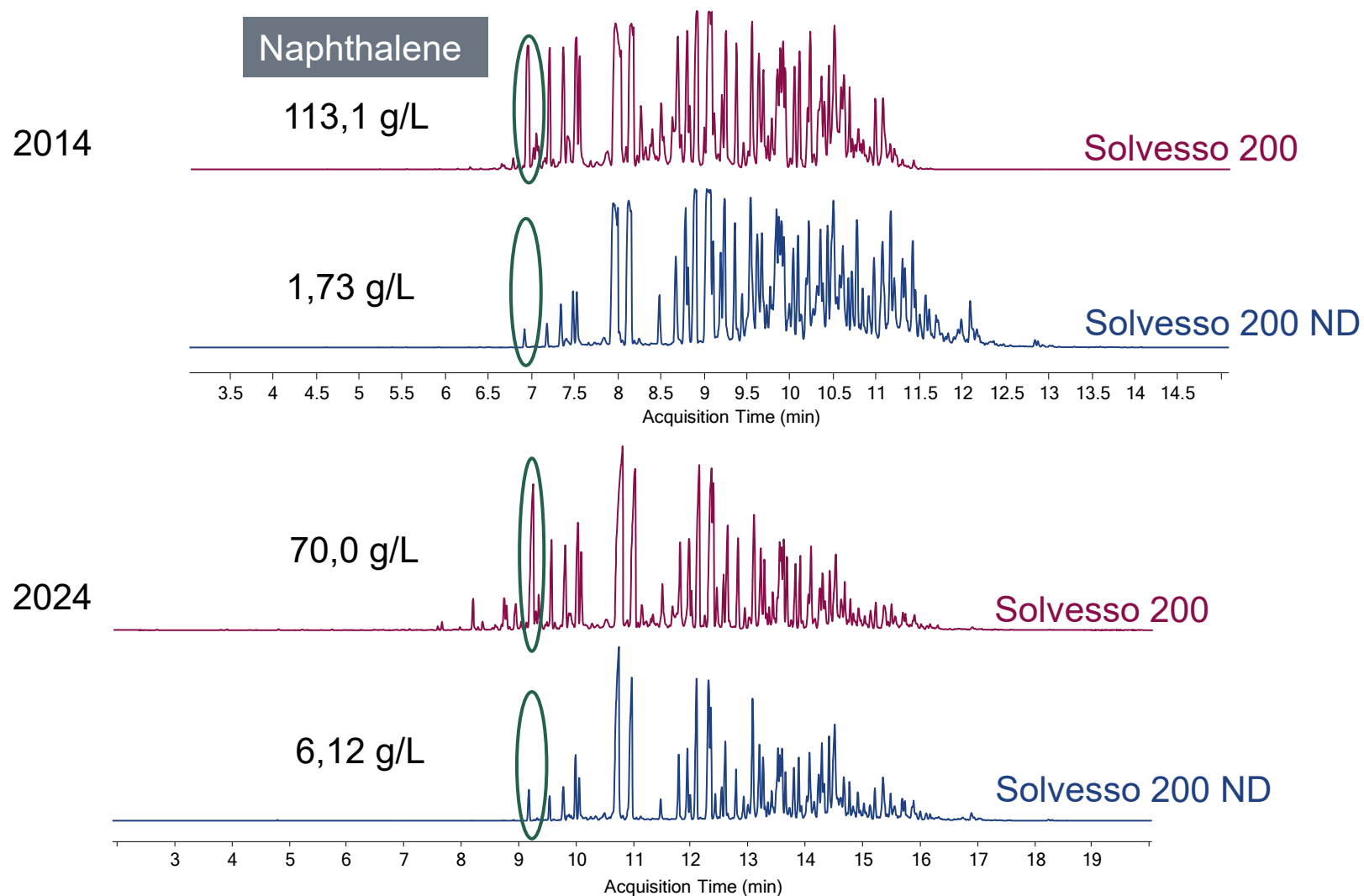


# Solvent naphtha co-formulants - evolution





# 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.

# Thanks a lot for your attention

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