

Sample preparation in Non-Target Screening for very polar compounds: Prospects and Difficulties

S. Veloutsou, W. Petreanu, J. Drewes, T. Letzel

Chair of Urban Water Systems Engineering
Department of Civil, Geo and Environmental Engineering
Technical University of Munich, Germany

Overview

1. The Challenge
2. The SPE Challenge
3. Applied Methods
4. Conclusion

1. The Challenge

Why to preconcentrate?

- Many compounds can be in trace levels that even with Large Volume Injection are not detectable.
- Laboratories without “sensitive” instruments.

Until now:

- Targeted analysis of polar compounds
- NORMAN screening trial of River Danube approach (*Schymanski et al., 2015, Anal. Bioanal. Chem*)

Very Polar compounds ?

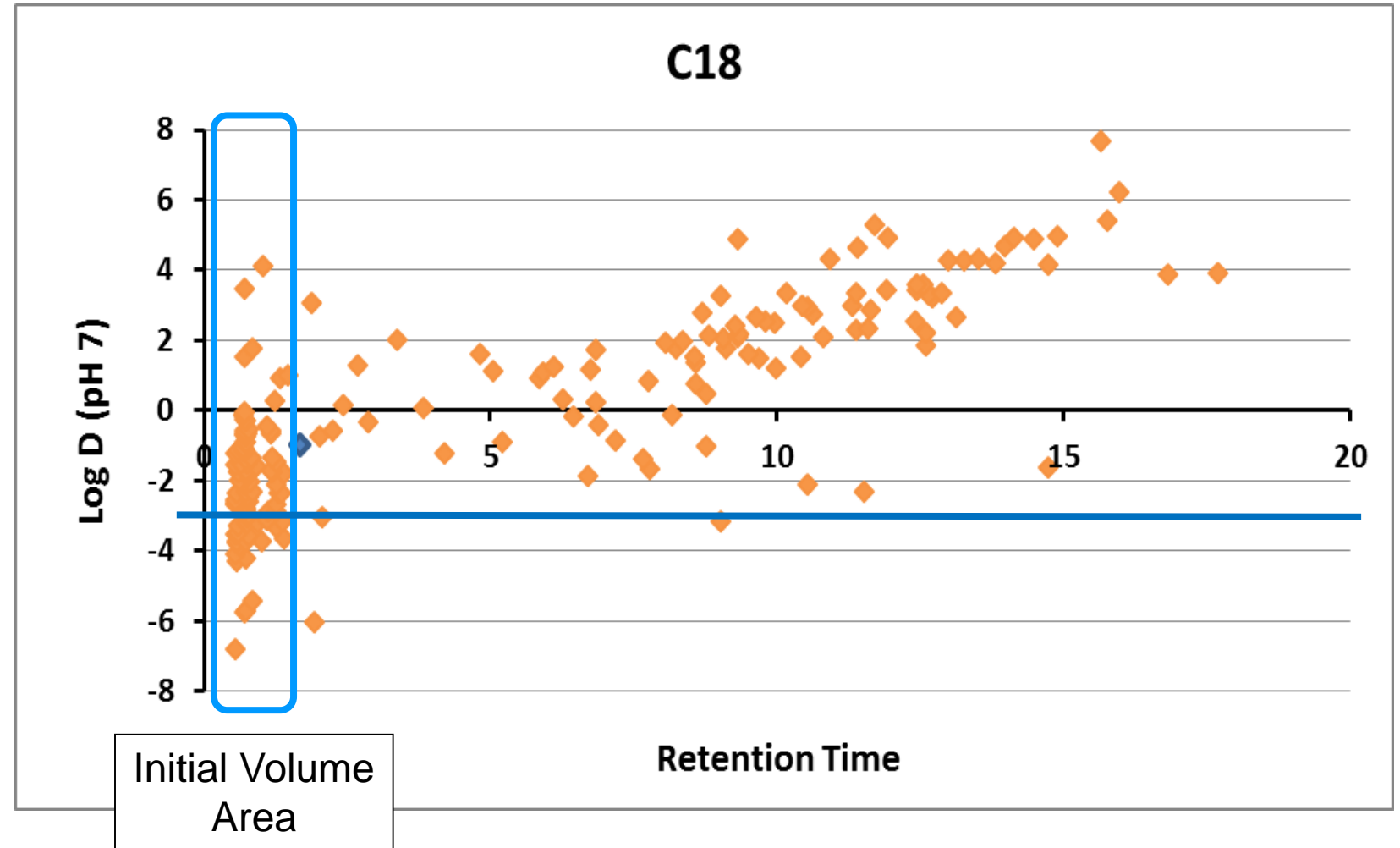


Compounds with
 $\text{LogD} < -2.5$ (pH7)

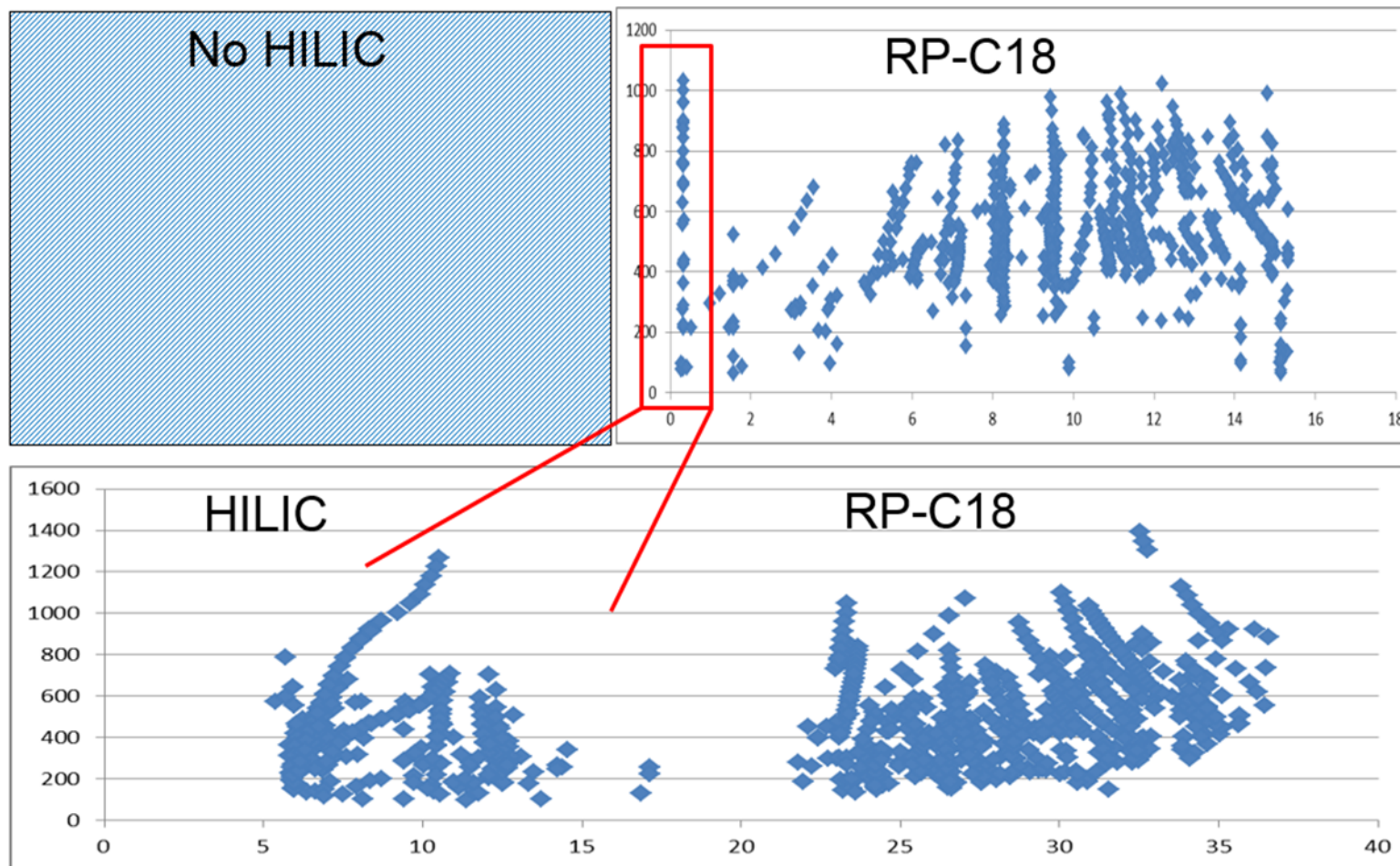
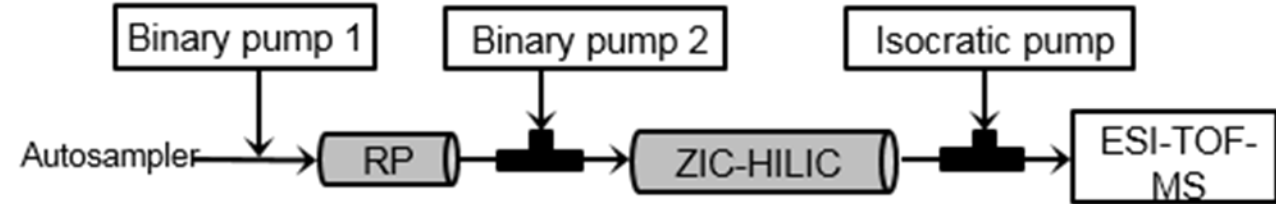


Not retained by:

- Polar embedded
- Polar Endcapped
- Non-Endcapped columns



Very Polar compounds ?

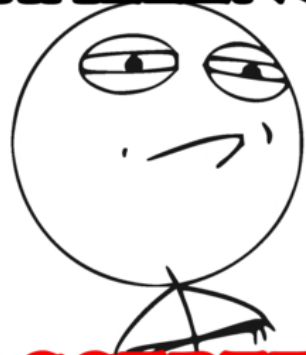


2. The SPE Challenge



“How do you take the very polar compounds out of the most polar solvent: water?”

CHALLENGE



ACCEPTED

→ “Get rid” of the water first!

“Bumps” on our road!

- The salt content of the sample
 - Salt depositions trapping compounds.
 - “Poisoning” of the [HILIC] absorbants.

- Time consuming and “harsh”.



3. Applied Methods

- Combination of RP SPE and HILIC SPE
- Lyophilisation (Freeze drying)
- Evaporation under Vacuum – BUCHI Syncore system
- {4. Membrane Nanofiltration}



4. Conclusion

Very polar compounds are becoming of increasing importance.

→ sample preparation procedure should also adjust, if needed.

Acknowledgements

Members of the Chair of Urban Water Systems Engineering



Funding:

- This work was partially funded by the German Federal Ministry of Education and Research within the RiSKWa Program, funding code 02WRS1354A.
- AiF
- FCI
- Leonhard-Lorenz-Stiftung

THANK YOU!

What is your opinion on very polars?

