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APPLICATION NOTE

Trap, Concentrate and Map, Using Acquity UPLC *I* class Plus. STYROS® R Polymeric Compared with C18 Acquity UPLC® BEH.

Although reversed phase columns should lend themselves to the process of trapping compounds that adsorb to hydrophobic surfaces, we have tested a C18 column with alkyl functions and compared it to a polymeric column with Aryl functions.

To be mindful of generated waste and use of excessive amount of solvents, narrow bore columns of 2.1 mm ID and 50 mm length were used in both cases.

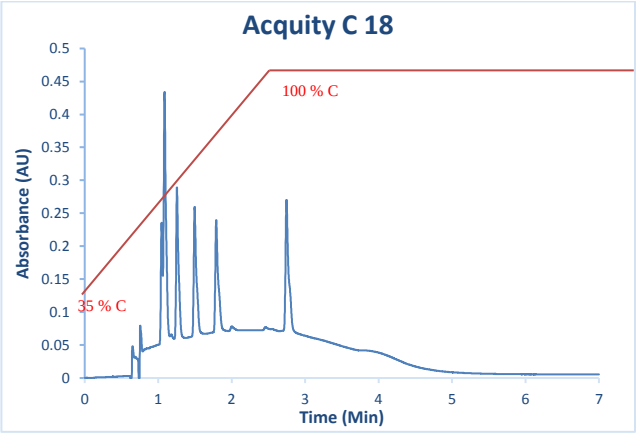
The process of trapping from a large amount of water waste would be shorter with a more efficient medium with a larger capacity and the proper pore channels during the trapping process.

The setup is simple with a single column online:

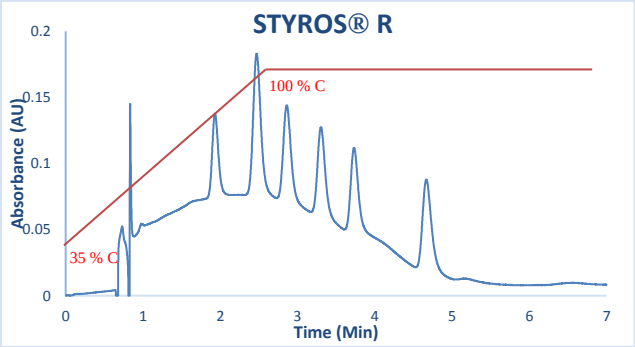
The buffers used consists of:

Solution A: DI H2O solution with the compounds to be trapped.
Buffer B: DI H2O (for mapping)
Buffer C: MeOH (for mapping)

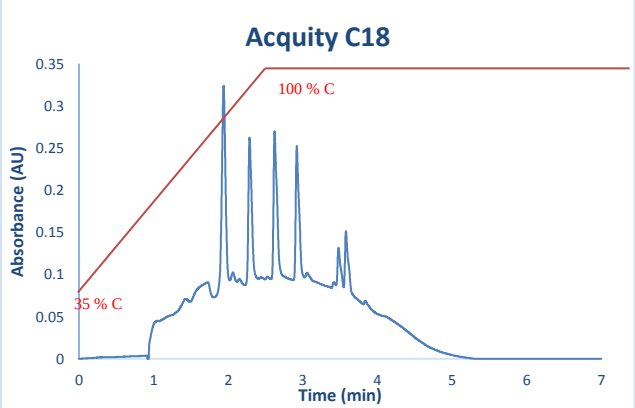
In a first step a C18 column was used. (acquityC18 BEH 1.7µm).
Since a gradient is run an equilibration step is required.
Using the Inlet Prerun of the Acquity *I* class, a 5 minutes run of the initial solvent gradient (H2O) is run at 0.3 ml/min followed by 2µl injection of a standard from Sigma-Aldrich (48271).
The gradient consists of an initial 35% MeOH, followed by the increase of the MeOH to 100 % in 3 minutes and run for 7 minutes as shown in the chromatograms.

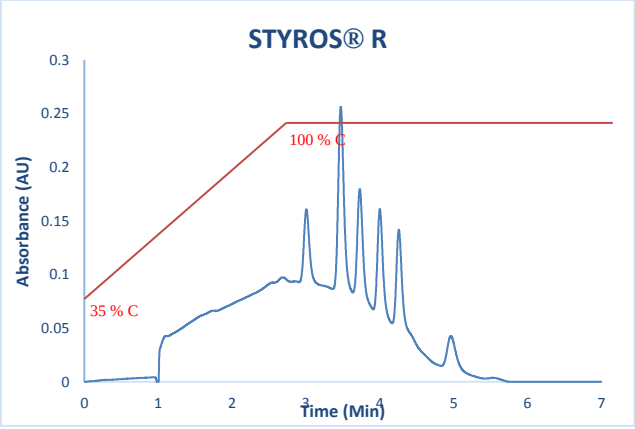


The 7 compounds in the sample, are depicted.
Under similar conditions, a polymeric column shows all compounds well separated.



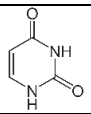
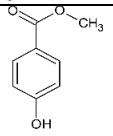
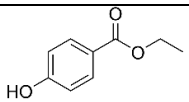
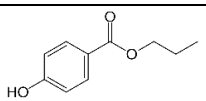
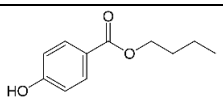
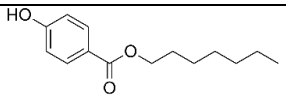
In the subsequent steps 0.5 ml of the standard sample is diluted in 500 ml of water and run through the columns for 5 minutes at 0.3 ml/min.
The concentration of the compounds is now in the range of µg to ng/ml.





The linear velocity in a narrow bore column at 0.3 ml/min of volumetric flow is around 520 cm/hr in an empty column. Therefore, these compounds are adsorbed regardless of the shear force at such linear velocity.
Furthermore, the STYROS® polymeric column being a Simulated-Monolith™ is not affected by the Eddy's shear as the small particle C18 is. Thus, the results observed.

The following chart depicts the compound involved in this experiment in order of dilution.

1		Uracil M=112.09
2		Phenol M= 94.11
3		Methyl Paraben M= 152.15
4		Ethyl Paraben M= 166.17
2		Propyl Paraben M= 180.20
6		Butyl Paraben M= 194.23
7		Heptyl Paraben M= 236.31

Inc.