# Agilent HPLC PetroSpher Columns

Data Sheet

## Warning

The Agilent PetroSpher A and PetroSpher B columns are packed with a derivatized silica material. Introduction of basic solvents (pH > 7) or acidic solvents (pH < 2) into the column may dissolve the silica material and damage the column. Some solvents may alter the stationary phase performance permanently (Note section 3). You should thoroughly familiarize yourself with the contents of this manual before using your column. Improper use will invalidate the warranty.

## 1. Introduction

Agilent PetroSpher A columns contain a polar-bonded silica based material, designed specifically for the separation of olefines and saturates from mono-aromatics in petroleum samples.

Agilent PetroSpher B columns also contain a polar-bonded phase, but ARE specifically designed for the separation of mono-, di and poly-aromatics in petroleum samples.

## 2. Column Conditioning

Before starting up the analysis, the column must be conditioned properly. An incorrectly conditioned column may cause bad performance, changing separation, etc. To condition this type of column, first rinse with 30 mL of 1,2-dichloroethane at 1 mL/min. After equilibrating the column with eluent (0.1% 1,2-dichloroethane in dry n-hexane) the column is ready for the analysis.

## 3. Eluent

The eluent recommended for this separation is 0.1 vol.-% 1,2-dichloroethane in dry n-hexane. Never use aqueous or wet eluents. Never use alcohols or other eluents containing hydroxide groups.

Never use eluents like aldehydes or ketones. The use of such eluents may permanently alter the stationary phase properties. Eluents must be dried on molecular sieves prior to use to prevent deactivation of the stationary phase and filtered through a 0.5 µm filter.

## 4. Flow and pressure

| Column internal diameter (mm) | Flow (mL/min) | |
|---|---|---|
| | Optimum | Maximum |
| 2.0 | 0.2 | 1.0* |
| 4.6 | 1.0 | 4.0* |
| 10.0 | 4.5 | 18.0* |

*Note: Maximum pressure:
for SS columns 300 bar (30 Mpa. 4500 psi)

An increase or decrease in flow rate must always take place in small steps, to prevent packing bed disturbances. High column pressures nearly always result from improper use of the column. Use of a guard column (see section 6) will usually prevent contaminants from accumulating on the analytical column.

## 5. Sample treatment

The key to long column life is proper treatment of samples prior to injection. Avoid the introduction of compounds whose hydrophobicity/polarity differs strongly from that of the mobile phase into the column by either mobile phases or samples. In particular, you should avoid introduction of particulate matter. These will ultimately cause an increase in operating pressure and may be difficult or impossible to remove.

## 6. Guard columns

Guard columns should always be used because sample and eluent contamination can result in excessive column pressures and altered selectivity.

We recommend a ChromGuard Polar Bonded High Capacity column for this type of separation. Replacement of the guard column is necessary when increased column pressure and/or loss of performance is observed. Sets of 5 guard replacement columns are available.

## 7. Injection volume and concentration

Agilent PetroSpher A/B columns of 4.6 mm i.d. are easily capable of handling non-diluted petrochemical samples of 50 µL. Higher injection volumes can also be injected but with the risk of losing resolution.

| Column dimensions L x i.d. | Maximum sample volume |
|---|---|
| 250 x 2.0 mm | ± 10 µL |
| 250 x 4.6 mm | ± 50 µL |
| 250 x 10.0 mm | ± 250 µL |

## 8. Temperature

Both Agilent PetroSpher columns can be used at ambient temperature.

## 9. Storage

## 10. Detection

The detection methods for this type of separation are Refractive Index detection or UV-absorbance detection at 210 nm. With the latter detection method saturates cannot be seen. Tandem detection with UV- and RI-detection in series offers the best perspectives from the viewpoints of saturate/olefin concentration determination and response factor control.

## 11. Possible causes of performance loss

- Extra column band broadening. Make sure the tubing length and tubing internal diameter are kept to a minimum.
- Insufficient equilibration time with starting eluent.
- Improper modifier concentration.
- Eluent not sufficiently dry. Dry the solvent on activated molecular sieves. Traces of water slowly deactivate the stationary phase.
- Bed compression. Excessive eluent flow rate has been used. Invert the column and use it at a lower flow rate.
- Particulate accumulation on frit or resin bed (together with back pressure increase). Track down the source of the particulates (sample, eluent, system). Invert the column and flush out the particles in the reversed flow direction. If this doesn't solve the problem, replace the inlet frit.

## 12. Regeneration

To regenerate the column:

- First invert the column.
- Rinse with 30 mL dry THF at 1 mL/min
- Rinse with 30 mL dry 1,2-dichloroethance at 1 mL/min
- Rinse with 30 mL of eluent at 1 mL/min
- Invert the column to the original position
- Equilibrate with the eluent

Note: For use of other eluents, read section 3 carefully.

www.agilent.com/chem


Published in The Netherlands, April 15, 2011
Part Number CP505126

Agilent Technologies