

Column Care and Regeneration - Eurokat

Eurokat is a sulfonated cross-linked styrene-divinylbenzene copolymer. This particular cation exchanger is characterized by 6% or 8% cross-linking and a very high density of functional groups.

In contrast to silica materials, polymer resins are extremely stable in aqueous media over the complete pH range. This is one striking advantage compared with silica where lifetime, especially in the higher pH range, is limited.

Eurokat is available in five different ionic species (H, Pb, Ca, Na and Ag). Eurokat H (8% crosslinking) can be used for the determination of organic acids and complex mixtures of acids, carbohydrates and alcohols, as well as sugar alcohols. Eurokat Ca and Pb (6% crosslinking) are suitable predominantly for carbohydrate analysis. Higher carbohydrates (DP > 4) are completely excluded from the pores. Eurokat Na and Ag (6% crosslinking) are suitable for carbohydrate oligosaccharides analysis up to DP 6.

To preserve the highest possible performance of your Eurokat column, the following points should be followed:

Column maintenance tips

- The maximum pressure limit during operating should not be exceeded 90 bar. The maximum pressure for the column material is 100 bar.
- Forceful mechanical handling (bumps, shocks) as well as sudden temperature changes should be strictly avoided to conserve the homogeneity of the packed column bed.
- Water used in preparation of the mobile phase should be either fresh double-distilled or HPLC-grade.
- All reagents used in sample preparation (solvents, reference compounds, etc.) should be of p.a. grade. Particulate matter and precipitates must be removed from the sample by filtration before injection.
- Changes in column temperature should only be undertaken under continuous eluent flow. As a principle, drastic temperature changes should always be carried out in gradual steps.
- The optimal temperature range for the analysis of carbohydrates is between 60 and 90°C.
- During heating process from room temperature keep the flow low at 0.1 ml/min for 4 mm and 0.2 ml/min for 8 mm columns until 60 °C.
- Flow rate changes should also only be carried out stepwise.
- Optimal flow rates are typically between 0.1 - 0.2 ml/min for 4 mm diameter columns and 0.4 - 0.8 ml/min for 8 mm diameter columns.
- If the column is not to be used for a longer period, the inlet and outlet should be sealed with appropriate blind fittings to prevent the polymer material from drying out. For long-term storage, the column should be kept at 8°C to avert bacterial growth.

Column Regeneration Procedure

Eurokat columns can be regenerated in their corresponding ionic form. Regeneration of the polymer resin is important to maintaining the selectivity and lifetime of the column material. If metal ions or organic components are present in the sample, these materials may settle on the resin material or even react with the polymer, resulting in a gradual loss of column performance. Through periodic cleaning of the column, lifetime and performance can be significantly prolonged. To clean the resin, Eurokat Pb, Ca, Na and Ag columns should be flushed for at least 4 hours (preferably overnight) with double-distilled water at a flow rate of 0.2 ml/min (8 mm ID column) in the reverse direction at 60-75 °C. Eurokat H columns can be cleaned in a similar manner but require 0.01 N sulfuric acid.

The column should then be rinsed for an additional hour with the same cleaning eluent in the normal flow direction at 75-85 °C. Maintaining this flow direction and temperature, Eurokat Pb, Ca, Na and Ag columns should then be purged with a mixture of 10% acetonitrile and 90% water. Eurokat H columns should be purged with 10% acetonitrile and 90% 0.01 N sulfuric acid.

After this cleaning process, the columns are to be regenerated as follows:

Eurokat Pb: purge with 0.25 mol/l lead nitrate at 75-85 °C at a flow rate of 0.2 ml/min (8 mm ID column) for about 4-6 hours

Eurokat Ca: purge with 0.25 mol/l calcium nitrate at 75-85 °C at a flow rate of 0.2 ml/min (8 mm ID column) for about 4-6 hours

Eurokat Na: purge with 0.25 mol/l sodium chloride or 0.1 mol/l sodium hydroxide at 75-85 °C at a flow rate of 0.2 ml/min (8 mm ID column) for about 4-6 hours

Eurokat Ag: purge with 0.25 mol/l silver nitrate at 75-85 °C at a flow rate of 0.2 ml/min (8 mm ID column) for about 4-6 hours

Eurokat H: purge with 0.05 mol/l sulfuric acid at 75-85 °C at a flow rate of 0.2 ml/min (8 mm ID column) for 4-6 hours

Once this procedure has been completed, the desired flow rate may be resumed gradually. The column is now ready for further analyses and can be put back into normal use once having gradually reached the working temperature.

Column using tips

In general, it is recommended that a precolumn (30 x 8 mm or 30 x 4 mm) is used. To eliminate undissolved particles or precipitates, the sample should be filtered through a 0.45 µm filter unit. Particulate matter in the eluent is removed by installing a column inlet filter between the injector and the column. To avoid contaminating the detector's measurement cell, neither the cleaning solution nor the regenerant should pass through the measurement cell.

Safety indication

Follow the general safety instructions for handling of the eluents used for column regeneration and take precautions against any kind of injuries or damage to health. Disposal of used HPLC columns must follow international, national and local environmental protection regulations.

The eluent exiting an Eurokat Pb column can contain lead in a concentration below the solubility product of lead sulphate. Disposal of these eluents must also follow international, national and local environmental protection regulations.

The use of HPLC columns is only permitted to staff members, who are qualified in their field. Keep HPLC columns away from children.

Failure to follow these precautions may void the column warranty. Technical data are subject to change without notice.

If there are any further questions do not hesitate to contact us:

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