KNAUER

Euroline

▶ Eurokat

Eurokat® Column Care and Regeneration

Eurokat is a sulfonated cross-linked styrene-divinylbenzene copolymer. This particular cation exchanger is characterized by 6% (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 three different ionic species (H, Ca, Pb). Eurokat H with 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.

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

Column maintenance tips

- The maximum limit for column pressure during operating should not be exceed 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. It is additionally recommended that the complete HPLC system be maintained at this temperature and at a low flow rate (e.g. 0.1 ml/min) when not in use.
- 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 longer term storage, the column should be kept at 4°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 and Ca columns should be flushed for at least 4 hours (preferably overnight) with double-distilled water at a flow rate between 0.1 – 0.2 ml/min in the reverse direction at an appropriate temperature. 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 and gradually cooled to ambient temperature. Maintaining this flow direction, Eurokat Pb and Ca columns should then be purged with a mixture of 20 % acetonitrile and 80 % water (vol./vol.). Eurokat H columns should be purged with 20 % acetonitrile and 80 % 0.01 N sulfuric acid (vol./vol.).

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

Eurokat Pb: purge with 0.25 M lead nitrate at 60 °C at a flow rate of 0.2 ml/min for about 4-6 hours

Eurokat Ca: purge with 0.25 M calcium nitrate at 60 °C at a flow rate of 0.2 ml/min for about 4-6 hours

Eurokat H: purge with 0.05 N sulfuric acid at 60 °C at a flow rate of 0.2 ml/min 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) be used. In order 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.

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