

Rtx[®]-5 MS Columns

GC/MS Analysis Instructions

The Rtx[®]-5 MS capillary column has been specifically developed to guarantee low column bleed on GC/MS systems, reproducible response factors and high inertness toward active semi-volatile pollutants. The Rtx[®]-5 MS polymer is batch-tested by mass spectrometry to ensure low column bleed and minimize bleed interferences with high molecular weight sample components such as polynuclear aromatic hydrocarbons (PAHs). Additionally, all Rtx[®]-5 MS columns are extensively tested with an environmental test mixture to ensure high column inertness and efficiency. The low bleed properties of the Rtx[®]-5 MS can be destroyed if the column is not installed correctly. The following operating hints will ensure that your column operates to its maximum capabilities.

Perform Air and Water Check Before Elevating Column Temperature

A common problem seen with GC/MS systems is high column bleed after installation. This bleed results from exposing/conditioning the column at high temperatures in the presence of an air leak. Always leak check and perform an air and water check on the column before elevating it in temperature. An air and water check is performed by scanning the masses 18 and 28 and comparing their relative response to mass 69 when the tuning valve is opened. Mass 18 and 28 should always be less

than 1% of mass 69 before elevating the column in temperature, otherwise a leak is present. Although some MS software programs incorporate automatic air and water checks, they usually reduce electron multiplier voltages and do not give accurate results. Figure 1 illustrates an air and water check performed on a leak-free system.

Measuring Column Bleed Correctly

A common problem that occurs is the impression that the column has high bleed. The real problem is how the column bleed is measured on the GC/MS system. Some GC/MS data systems use an autoscale feature which normalizes the intensity axis to the largest peak in the chromatogram. If there are no peaks present, the chromatogram is drawn with the baseline at full scale, giving the illusion that the column has high bleed. The most accurate way to measure column bleed is to inject a known concentration of a component and temperature program the column to the maximum operating temperature of the method. Measure the peak height of the component and compare it to the baseline offset from the bleed. Figure 2 illustrates the effect of measuring column bleed with no peaks present in the chromatogram and by using a test mixture of known concentration. As seen in the figure, without injecting a component of known concentration, the bleed level appears much higher than it actually is.

Figure 1

An air and water check performed on a leak-free system.

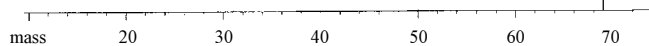
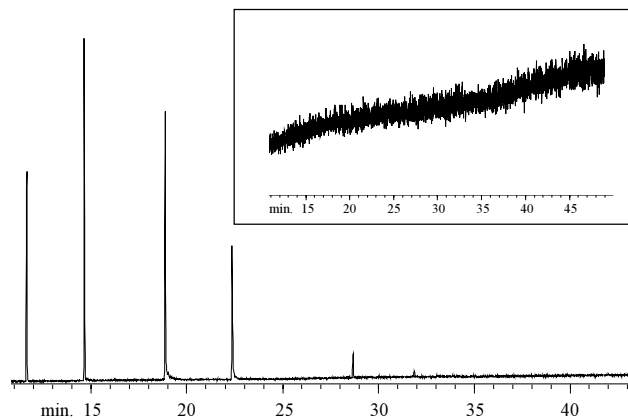


Figure 2

The autoscaling feature of some GC/MS systems often gives the impression of high column bleed unless a peak of known concentration is present.



Polymer batch testing by GC/MS ensures low column bleed

High column bleed can lead to inaccurate quantitative results, confused spectral interpretation, decreased sensitivity, and in extreme cases mis-identification. Each new Rtx[®]-5 MS polymer lot is batch-tested by GC/MS using a temperature-programmed test mixture and must meet demanding criteria for low bleed before the polymer is accepted. The attached GC/MS bleed chromatogram shows the low MS bleed representative of this polymer.

Thorough QA testing of each Rtx[®]-5 MS guarantees consistent results

All Rtx[®]-5 MS columns are evaluated with a specially designed, temperature-programmed test mixture to meet strict performance requirements. This test mixture contains some of the most sensitive semi-volatile compounds for testing inertness and is temperature programmed to monitor bleed at the column's maximum operating temperature. The attached chromatogram shows the environmental test mixture on the Rtx[®]-5 MS. Excellent response of active pollutants such as 4-nitrophenol, 2,4-dinitrophenol, and pentachlorophenol is achieved. Additionally, high column efficiency is demonstrated by the resolution of the PNA isomers, benzo(b) and (k) fluoranthene.

Call Technical Service at 800-356-1688 or 814-353-1300, ext. 4 (or your local Restek representative) if you have any questions about this product or any other Restek product.



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