

# Intermediate Polarity Capillary GC Column for Basic Compounds

## Rtx<sup>®</sup>-35 Amine Column Improves Analysis of Amines and Nitrogen Heterocyclics

By Neil Mosesman, GC Columns Product Marketing Manager

- ✓ Improved responses compared to conventional columns.
- ✓ Symmetrical peaks for basic compounds.
- ✓ Resolve low molecular weight primary amines.

Amines and nitrogen heterocyclics are used to manufacture a wide variety of products, including dyes, chelating agents, stabilizers, pesticides, and pharmaceuticals. Gas chromatographic analysis of these and other basic compounds can be difficult, because the active compounds typically exhibit adsorption and peak tailing. An Rtx<sup>®</sup>-35 Amine column is ideal for analyses of these polar and low molecular weight amines.



The proprietary deactivation of the 35% phenyl Rtx<sup>®</sup>-35

amine phase improves response and peak symmetry compared to conventional 35% phenyl columns. A test mixture of amines at concentrations of 10 to

15ng/μL was analyzed on an Rtx<sup>®</sup>-35 Amine column and a conventional 35% phenyl column.

Ethanolamines are particularly difficult to analyze because in addition to their basic nature they have a hydroxyl group that can interact with silanol groups on the inner surface of the column. The conventional column completely adsorbed diethylenetriamine and diethanolamine, but the Rtx<sup>®</sup>-35 Amine column gave excellent responses and peak shapes for all compounds (Figure 1).

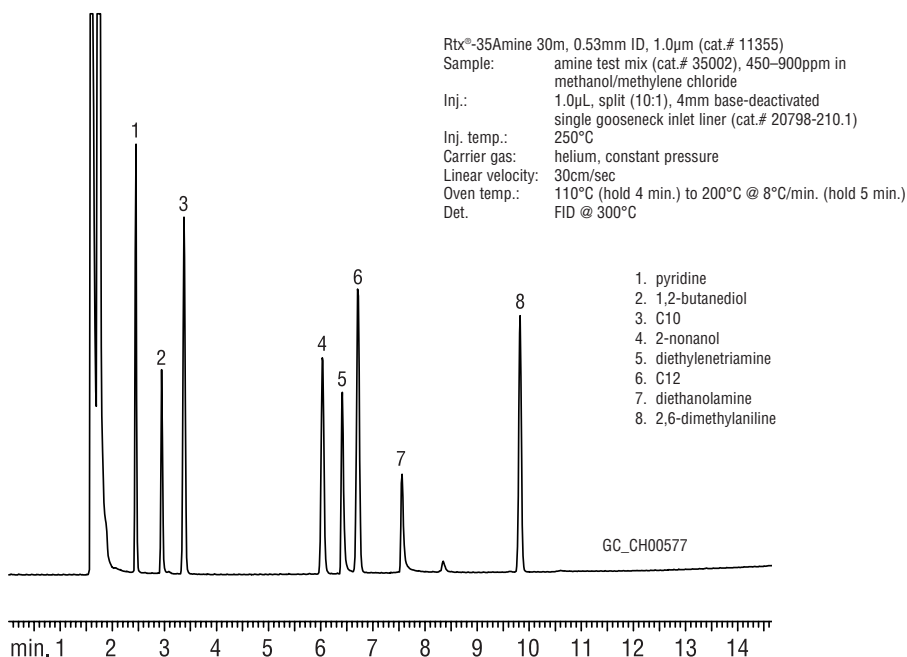
Primary amines often are analyzed on a Stabilwax<sup>®</sup>-DB column because it resolves these compounds well. However, the maximum operating temperature of this column, 220°C, limits the molecular weight range of the analytes. Alternatively, an Rtx<sup>®</sup>-5 Amine column has a much higher maximum operating temperature, 315°C, but does not adequately resolve primary amines. An Rtx<sup>®</sup>-35 Amine column combines the advantages of a Stabilwax<sup>®</sup>-DB column and an

Rtx<sup>®</sup>-5 Amine column: it resolves primary amines and has high thermal stability. An Rtx<sup>®</sup>-35 Amine column offers excellent peak shape and high responses for these active compounds (Figure 2).

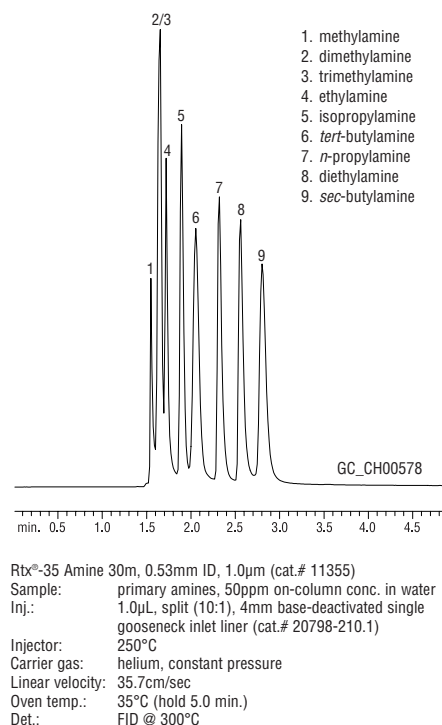
When analyzing basic drugs by GC, derivatization often is required to reduce peak tailing or improve response. These complex procedures can improve quantitative results, but they add time and cost to the analysis. An Rtx<sup>®</sup>-35 Amine column provides the selectivity to analyze a wide range of underivatized drug compounds. Many over-the-counter and prescribed medications for cold and flu relief contain amines and other basic compounds. The unique deactivation and selectivity of an Rtx<sup>®</sup>-35 Amine column, combined with its high thermal stability, simplifies the analysis for these components (Figure 3). Underivatized sympathomimetic amines also exhibit excellent peak shape and separation on an Rtx<sup>®</sup>-35 Amine column (request lit. cat.# 59380).

Because the Rtx<sup>®</sup>-35 Amine column offers excellent response and peak symmetry for amines and polar basic compounds, and has high thermal stability, analysts working with these analytes can improve the reliability and consistency of their data.

**Figure 1** An Rtx<sup>®</sup>-35 Amine column minimizes adsorption and improves responses for amines.



**Figure 2** An Rtx<sup>®</sup>-35 Amine column offers good resolution of primary amines.



### Base-Deactivated Inlet Liners

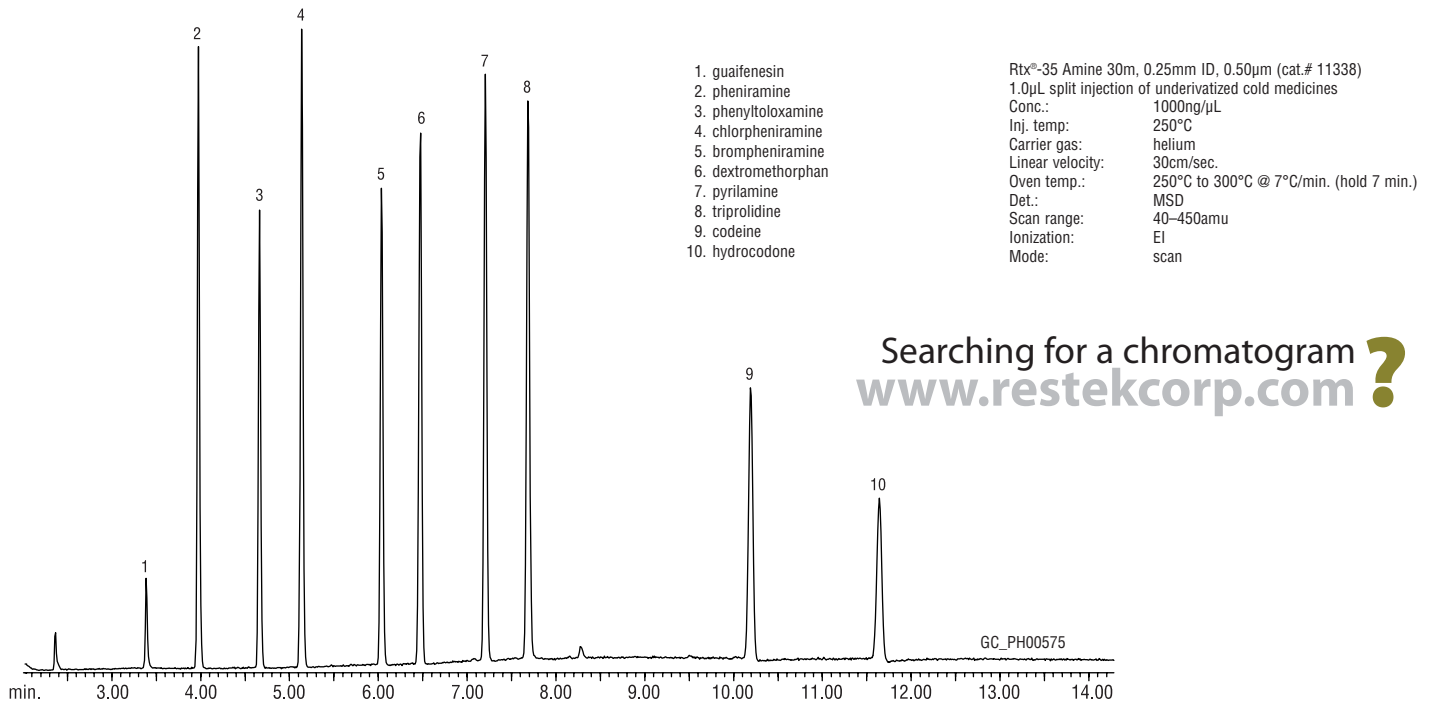
Add the corresponding suffix number to the liner catalog number. For inlet liners, see our 2004 *Chromatography Products Guide* (lit. cat.# 59854).

| qty.   | Base-Deactivated |            | Base-Deactivated w/ | Base-Deactivated Wool |
|--------|------------------|------------|---------------------|-----------------------|
| each   | -210.1           | addl. cost | -211.1              | addl. cost            |
| 5-pk.  | -210.5           | addl. cost | -211.5              | addl. cost            |
| 25-pk. | -210.25          | addl. cost | -211.25             | addl. cost            |

## For more info

For chromatograms of ethanolamines and amphetamines on Rtx<sup>®</sup>-35 Amine columns, request lit. cat.# 59380.

**Figure 3** An Rtx®-35 Amine column simplifies GC/MS analysis of common cold and flu medications.



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**Rtx®-35 Amine Columns (fused silica)**

(Crossbond® 35% diphenyl/65% dimethyl polysiloxane)

| ID     | df (µm) | temp. limits   | 15-Meter | 30-Meter |
|--------|---------|----------------|----------|----------|
| 0.25mm | 0.50    | 0 to 290/310°C | 11335    | 11338    |
|        | 1.00    | 0 to 280/300°C | 11350    | 11353    |
| 0.32mm | 1.00    | 0 to 280/300°C | 11351    | 11354    |
|        | 1.50    | 0 to 270/290°C | 11366    | 11369    |
| 0.53mm | 1.00    | 0 to 260/280°C | 11352    | 11355    |
|        | 3.00    | 0 to 240/260°C | 11382    | 11385    |

**Base-Deactivated Guard Columns**

For analyzing basic compounds, use a base-deactivated guard column. For a 5m base-deactivated guard column, order cat. # 10000 (), 10001 (), or 10002 () (0.25, 0.32, or 0.53mm ID, respectively). For more information on guard columns, see our 2004 *Chromatography Products Guide* (lit. cat.# 59854).