

## Mobile Phase Additives for LC-MS. 1. Introduction ..... Sigma-Aldrich offers a large selection of high purity acids, bases and salts to control analyte ionization and improve LC-MS signal. This is the introduction to a five-part series on mobile phase additives for LC-MS to appear in each of the issues of Analytix in 2006

By Joachim Emmert, Senior Scientist R&D, Fluka / Riedel-de Haën ... [jemmert@sial.com](mailto:jemmert@sial.com)  
Frederik Pillong, Product Manager, Fluka / Riedel-de Haën ... [fpillong@sial.com](mailto:fpillong@sial.com)

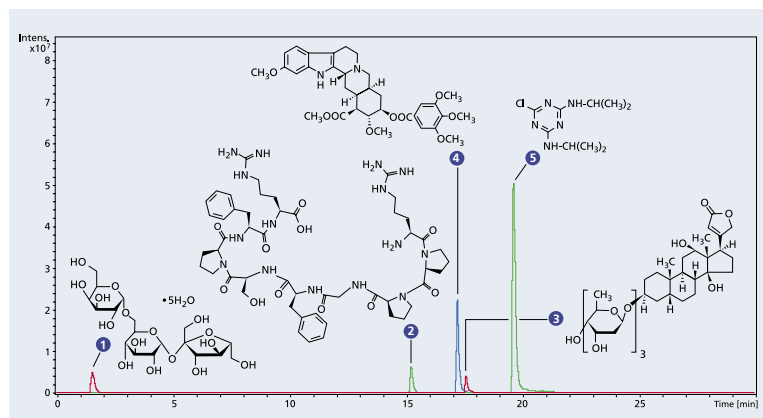
It is common practice in LC-MS to add certain chemicals to the mobile phase or introduce them post-column prior to the interface to influence analyte ionization. Most often, an improvement in the analyte signal is the goal. However, some additives may be used to suppress unwanted signals or selectively enhance the signal of particular compounds in a mixture, for example glycosidic species in a mixture of peptides.

Sigma-Aldrich, a leading supplier of chemicals for analytical applications, offers a wide range of high purity additives for LC-MS applications in addition to our pure CHROMASOLV® solvents and ready-to-use blends. Our offering includes the most commonly used acids, bases, volatile salts and a sodium source (see Table). All are of high purity, usually puriss p.a., and are tested for LC-MS application.

### Product List ..... LC-MS CHROMASOLV® Mobile Phase Additives

Cat. No.	Brand	Description*	Pack Size	Packaging
40967	Fluka	Trifluoroacetic acid, puriss p.a., eluent additive for LC-MS	50 mL	HDPE bottle
40967	Fluka	Trifluoroacetic acid, puriss p.a., eluent additive for LC-MS	10 x1 mL	Glass ampoule
56302	Fluka	Formic acid, puriss p.a., eluent additive for LC-MS	50 mL	HDPE bottle
49199	Fluka	Acetic acid, puriss p.a., eluent additive for LC-MS	50 mL	HDPE bottle
49916	Fluka	Propionic acid, puriss p.a., eluent additive for LC-MS	50 mL	HDPE bottle
55674	Fluka	Ammonium formate, puriss p.a., eluent additive for LC-MS	50 g	HDPE bottle
49638	Fluka	Ammonium acetate, puriss p.a., eluent additive for LC-MS	50 g	HDPE bottle
61333	Fluka	Sodium citrate tribasic dihydrate, puriss p.a., eluent additive for LC-MS	50 g	HDPE bottle
40867	Fluka	Ammonium bicarbonate, puriss p.a., eluent additive for LC-MS	50 g	HDPE bottle
44273	Fluka	Ammonium hydroxide solution 25%, puriss p.a., eluent additive for LC-MS	100 mL	HDPE bottle
65897	Fluka	Triethylamine, puriss p.a., eluent additive for LC-MS	50 mL	HDPE bottle

\* "puriss" quality grade is defined as >98.5% assay, <0.1% ash, and specification n + 0.001, d + 0.001 with no extraneous color and an homogeneous appearance. "p.a." or *pro analysis* denotes a product with guaranteed trace impurity levels and/or suitability for the indicated analytical application.



**Figure 1** ..... Extracted ion chromatogram of 5 test compounds with LC-MS CHROMASOLV® 0.1% acetic acid as mobile phase additive; elution order: raffinose, bradykinin, reserpine, digoxin, propazine (For details, please see next issue of this newsletter)

The influence of these additives will be discussed and demonstrated in a five part series with model compounds in upcoming issues of the Analytix.

- Part 1: „Acids - The Most Common Choice“
- Part 2: „How to Overcome Suppression Effects of TFA“
- Part 3: „The Neutral Salts“
- Part 4: „Special Case - Sodium Adduct Formation“
- Part 5: „The Bases, Reverse Buffering, Negative and Reverse Ionization“

### Product List ..... Test compounds

Cat. No.	Brand	Compound	Class	Elution Order	Molecular Mass
83400	Fluka	Raffinose	Saccharides	1	504.2
15859	Fluka	Bradykinin	Peptides	2	1059.6
37100	Fluka	Digoxin	Glycosides	3	780.4
R-0875	Sigma	Reserpine	Alkaloids	4	608.3
45640	Fluka	Propazine	Triazines	5	229.1

In each part of the series, we will demonstrate the effects and influences of additives belonging to a particular group on five model compounds which are representative of a typical class of analytes.