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# **LC-MS and High Throughput**

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## **Introduction**

### **HPLC Columns for LC-MS and HTS**

In the most demanding LC-MS analyses, impurities that must be identified are present only in trace amounts. The chromatography column must give the highest possible efficiency to provide the most concentrated LC fraction to the mass spec for maximum sensitivity. Most of the phases in this catalogue are available in 3 µm particles to further enhance the resolution of the particular analysis.

Combinatorial chemistry has replaced many older synthesis methods for faster development and structural activity relationships. This has resulted in the need for extremely rapid analysis of each mixture to better characterise the active components. As many as 1000 mixtures or more per day have to be analysed and then potentially purified by HPLC.

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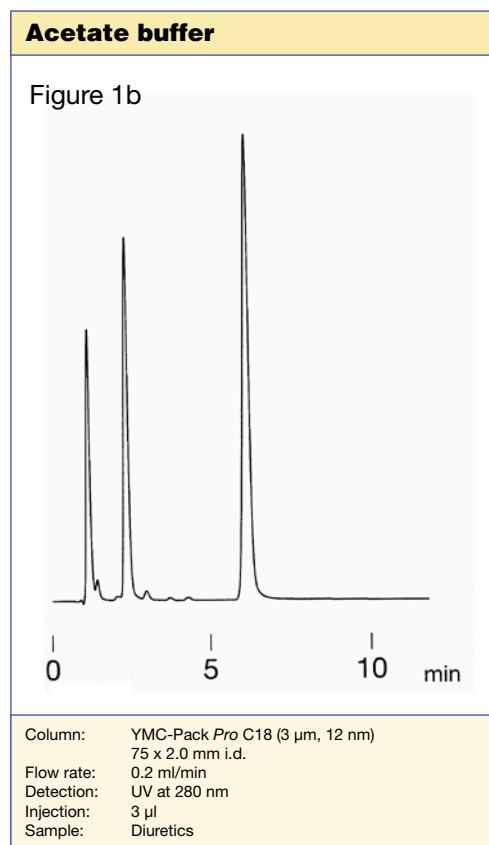
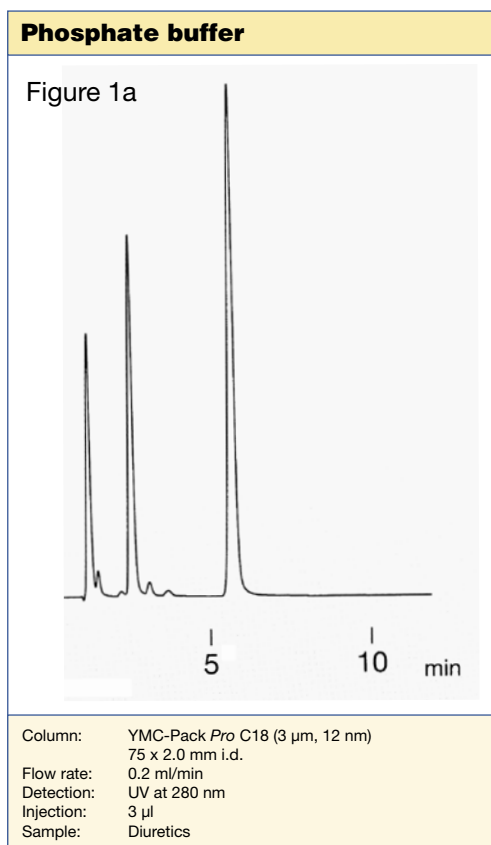
# LC-MS

- low bleed-stationary phases for highly sensitive detection
- special 20 mm cartridges with 2, 3, or 4 mm i.d. for high throughput chromatography
- highly inert silica allows the use of TFA / acetic acid / formic acid as mass spec compatible additives



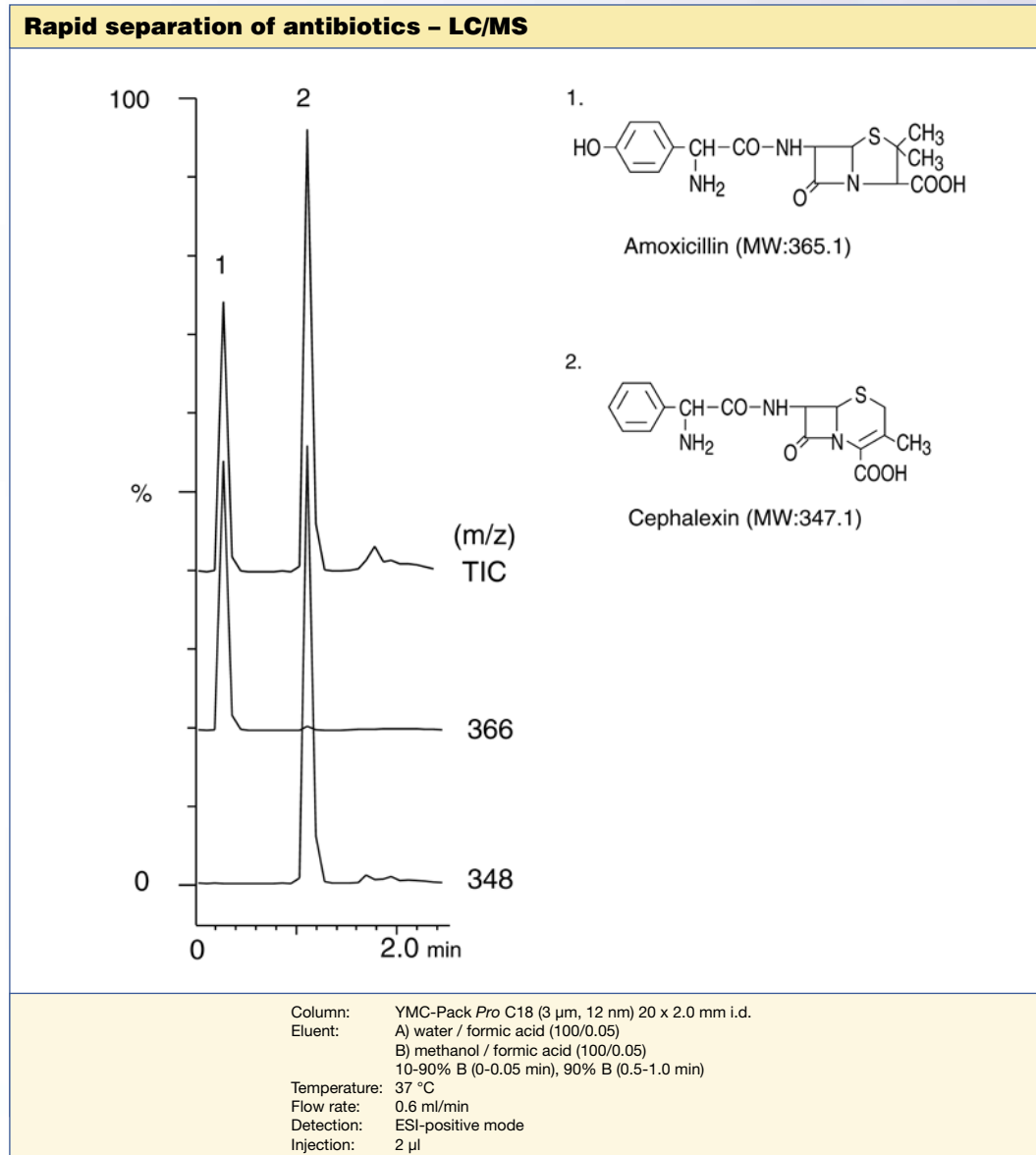
## General

YMC's high purity silica-based materials provide ideal supports for LC-MS, with many methods being directly adaptable to mass spectrometric analysis due to the low requirement for buffer salts or modifiers to achieve good peak shape. Organic acids such as acetic acid, which do not affect the mass spec, can be used to replace acidic phosphate buffers (Fig. 1a/1b). In some cases, when acetic acid changes the phase selectivity, TFA is a good substitute. YMC columns for LC-MS are thoroughly endcapped and very resistant to the tailing typical of amine samples.



YMC-Pack Pro C18 achieves good separation even when it is used with acetate buffer, which is often used for LC-MS analysis. The separation is similar to that achieved with phosphate buffer. The semi-micro columns with a particle size of 3  $\mu$ m are especially useful because the theoretical plate number is high.

## Application



# CombiChrom™

- short columns (50 mm) designed for high throughput, high flow rate and fast equilibration
- also available as R&D scale-up kit
- for fast sample screening in combinatorial chemistry

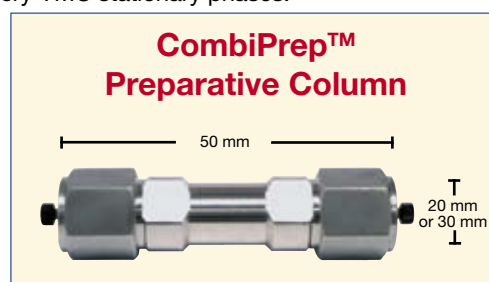
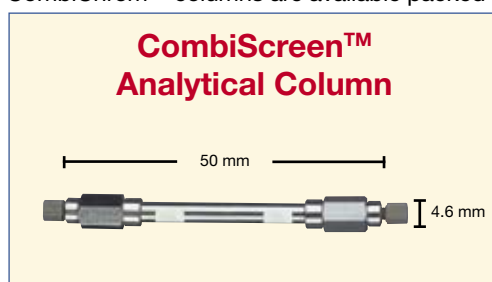


## General

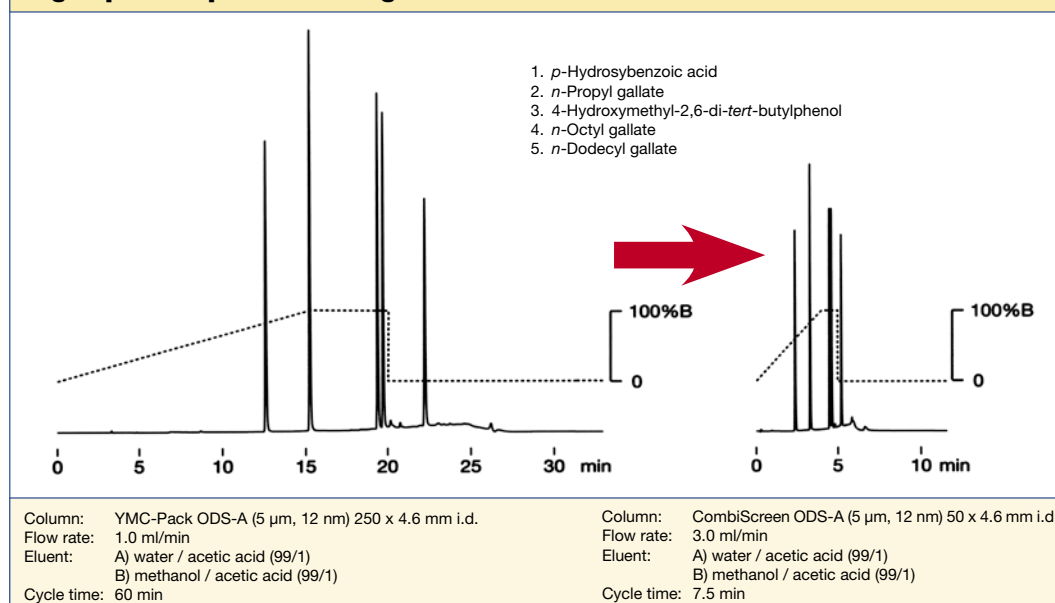
Combinatorial chemistry has replaced many older synthesis methods for faster development and structural activity relationships. This has resulted in the need for extremely rapid analysis of each mixture to better characterise the active components. As many as 1000 mixtures or more per day have to be analysed and then potentially purified by HPLC. The greatest challenge is to keep up with the large number of samples without sacrificing chromatographic efficiency and column performance.

YMC has met these challenges with CombiChrom™ columns. These columns combine the high efficiency of small particles with the speed of short columns to reduce the time of analysis. CombiChrom™ columns are designed for rapid equilibration and changeover to new conditions without loss of performance.

CombiChrom™ columns are available packed with every YMC stationary phases.



## High-speed separation using CombiChrom™



# Ordering Information LC-MS

## Column Dimensions

YMC columns are available in various dimensions. However, small inner diameters are preferred, because only low flow rates are required which allow direct access to the MS interface. Additionally, the sensitivity for smaller inner diameters is higher and only small sample amounts are necessary.

In LC-MS high throughput chromatography, ultra short analysis times are demanded. For this purpose YMC offers LC-MS cartridges with 20 mm length and 2.1, 3 and 4 mm i.d.. These cartridges fulfil the same high quality standards as the YMC analytical columns but allow an accelerated sample throughput and rapid re-equilibration. For high efficiency, the use of 3 µm particle sizes is recommended. Please find below ordering information on a selection of LC-MS cartridges. For more details please refer to the individual selectivities listed in the table on page 20/21.



## Fast LC-MS cartridges

Dimensions	YMC-Pack Pro C18 3 µm particle size	Hydrosphere C18 3 µm particle size	YMC-Pack Pro C18 RS 3 µm particle size	J'sphere ODS-H80 4 µm particle size
20 x 2.1 mm	AS12S030202MS1	HS12S030202MS1	RS08S030202MS1	JH08S040202MS1
20 x 3.0 mm	AS12S030203MS1	HS12S030203MS1	RS08S030203MS1	JH08S040203MS1
20 x 4.0 mm	AS12S030204MS1	HS12S030204MS1	RS08S030204MS1	JH08S040204MS1

**Note:** For your first order on LC-MS cartridges, please add 1 pc. cartridge holder (part.-no. XPGCE-Q2) per system to your order list. The holder can continuously be re-used and, thus it is not required for repeat orders.

# Ordering Information CombiChrom™

Stationary phase	CombiScreen™ 50 x 46 mm i.d.	CombiPrep™ 50 x 20 mm i.d.	CombiPrep™ 50 x 30 mm i.d.
Pro C18 RS	CCRSS050546	CCRSS050520	CCRSS050530
Pro C18	CCASS050546	CCASS050520	CCASS050530
Hydrosphere C18	CCHSS050546	CCHSS050520	CCHSS050530
Pro C8	CCOSS050546	CCOSS050520	CCOSS050530
Pro C4	CCBSS050546	CCBSS050520	CCBSS050530
ODS-A	CCAAS050546	CCAAS050520	CCAAS050530
ODS-AQ	CCAQS050546	CCAQS050520	CCAQS050530
ODS-AL	CCALS050546	CCALS050520	CCALS050530
ODS-AM	CCAMS050546	CCAMS050520	CCAMS050530
YMCbasic	CCBAS050546	CCBAS050520	CCBAS050530
C8 (Octyl)	CCOCS050546	CCOCS050520	CCOCS050530
C4 (Butyl)	CCBUS050546	CCBUS050520	CCBUS050530
SIL (Silica)	CCSL050546	CCSL050520	CCSL050530
CN (Cyano)	CCCNS050546	CCCNS050520	CCCNS050530
Diol	CCDLS050546	CCDLS050520	CCDLS050530
PVA-Sil	CCPVS050546	CCPVS050520	CCPVS050530



**R&D:** To order fully matched R&D CombiChrom™ column kits simply add "CCRD" to the desired phase code:

Example: AS12S05CCRD

and you will receive one CombiScreen™ column 50 x 4.6 mm and one CombiPrep™ column 50 x 20 mm i.d. with identical selectivity.

Guard cartridges and guard cartridge holders for all CombiScreen™ and CombiPrep™ columns are available on request.

For details on YMC selectivities and the International Product Code please refer to page 20/21 and 241, respectively.