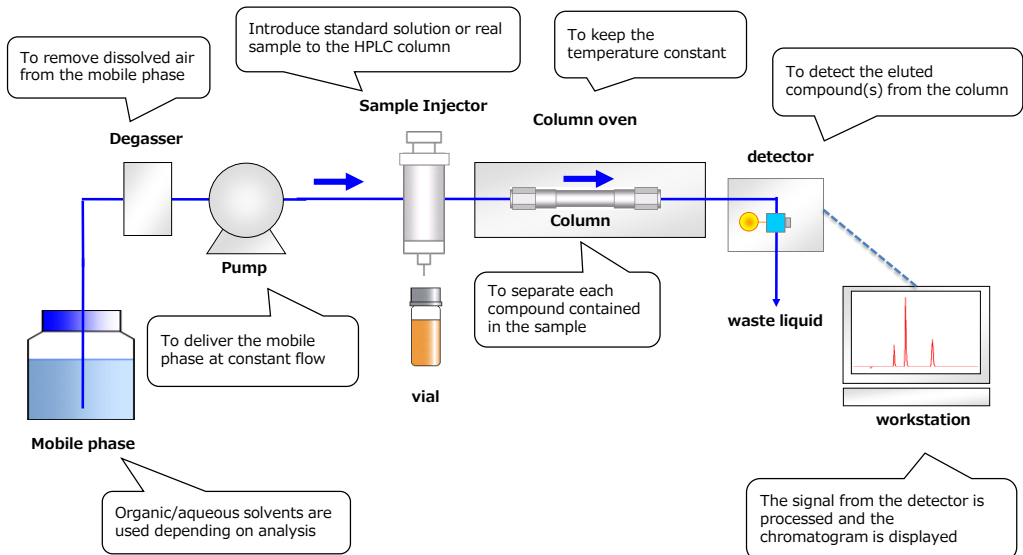


Fundamentals of HPLC

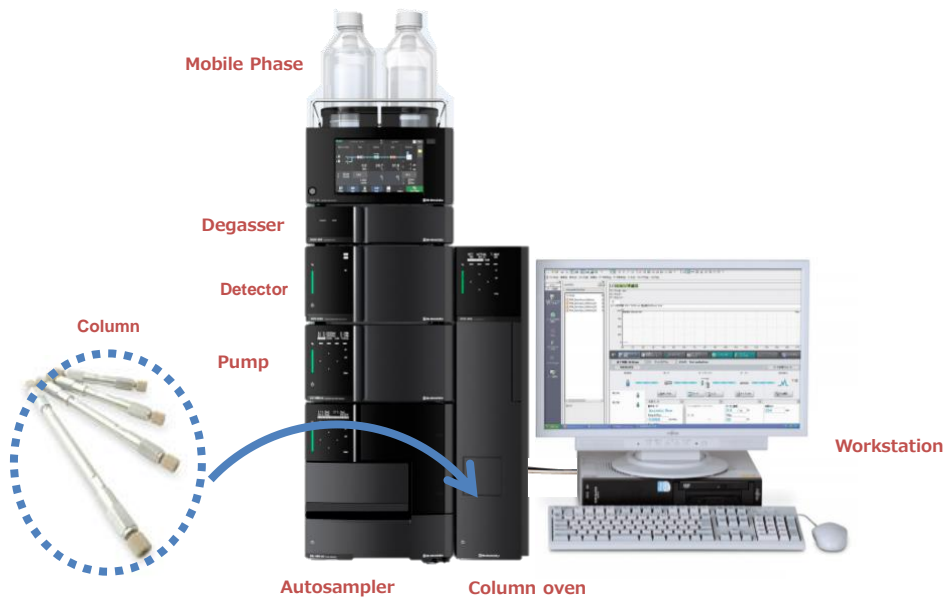
3 _ Apparatus constituting HPLC (1)

Shimadzu Corporation
Analysis and Measurement Division
Global Application Development Center
Content : Natsuki Iwata (May,2021)

Configuration of HPLC system

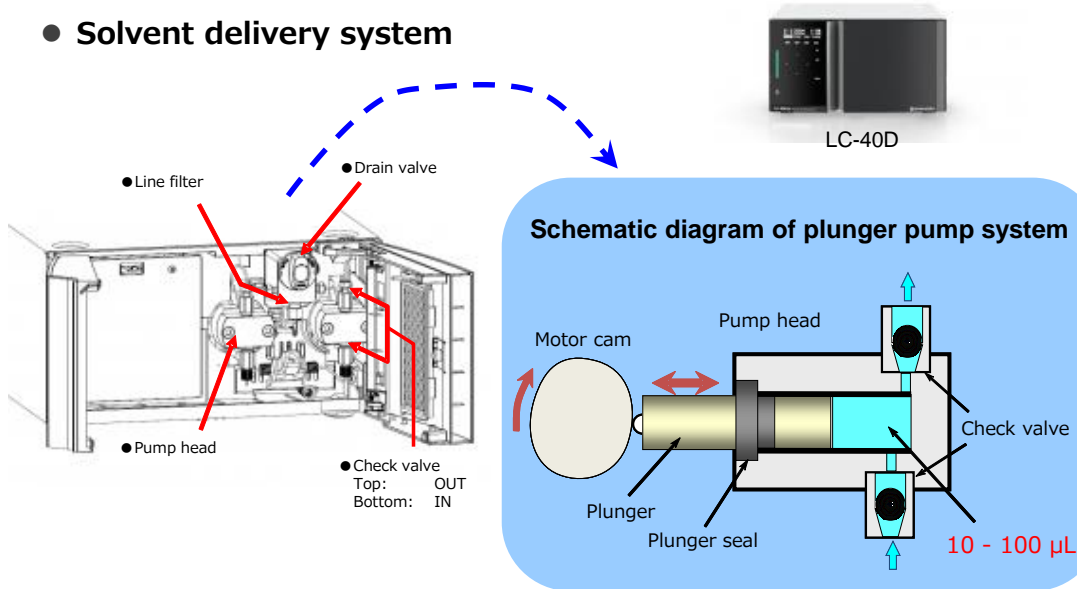


What does the HPLC system look like?



Solvent delivery pump

● Solvent delivery system



Isocratic elution and gradient elution

● Isocratic elution

- Method with a mobile phase of constant composition
- Useful for analyzing one compound or several compounds that have similar retentions

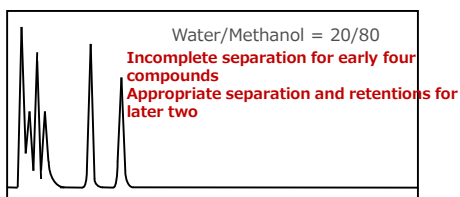
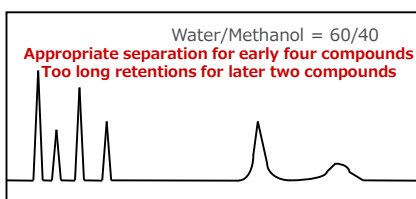
● Gradient elution

- Method with two or more components in a mobile phase and its composition is being changed depending on analysis time
- Useful for simultaneous analysis of compounds that have wide range of retentions

Effect of gradient elution

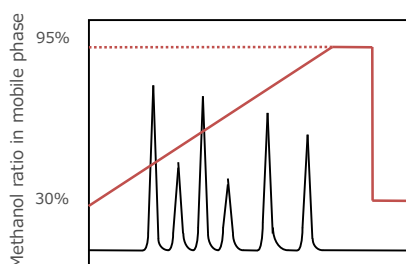
● Separation efficiency

● With isocratic elution . . .



● With gradient elution . . .

Changing mobile phase composition
depending on analysis time



Shorter analysis time with appropriate separation

(In case of reversed-phase chromatography)

Sample injection

- **Manual injector**

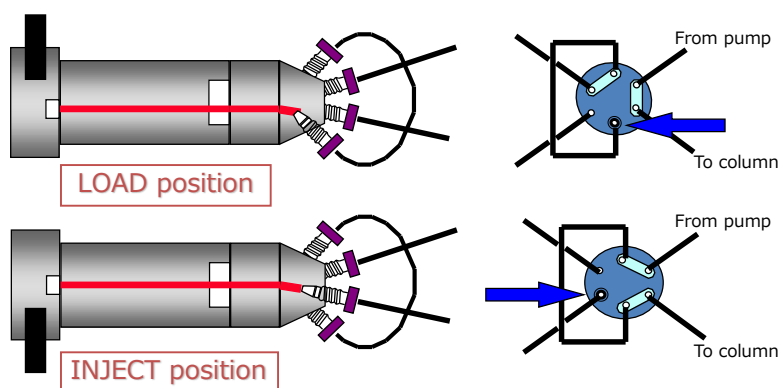
- Apparatus for **manually** introducing a sample into a column
- Syringe (1 to 50 μL) is used to introduce a sample
- Accurate injection volume and timing could be difficult

- **Autosampler**

- Apparatus for **automatically** introducing a sample into a column
- It repeatedly introduces samples set in autosampler
- It allows to inject samples precisely at the identical interval set by method and this accuracy is necessary for gradient elution

Manual injector

- Apparatus for **manually** introducing sample into column

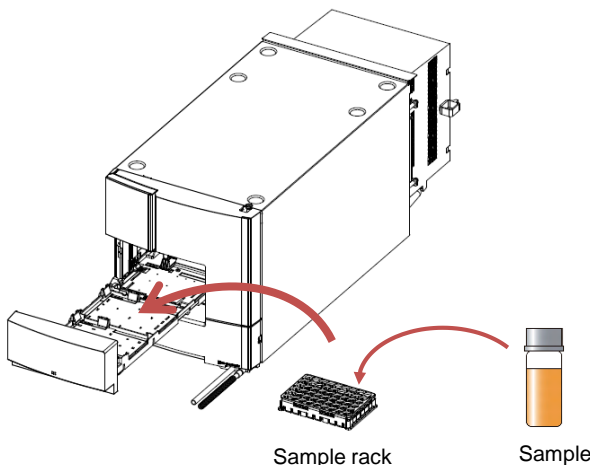


Autosampler

- Apparatus for **automatically** introducing sample into column



SIL-40CXR



Sample rack

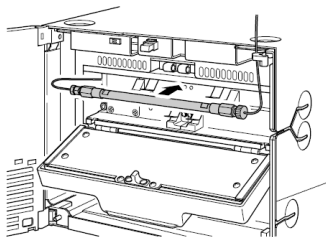
Sample

Column oven

- Apparatus for keeping column temperature constant

- Block Heater Type

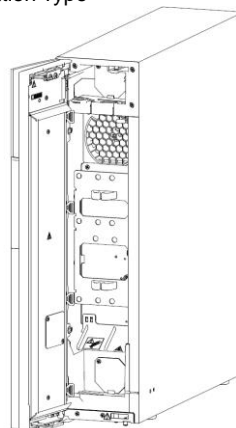
- Air Circulation Type



CTO-30A



CTO-40S



Thank you for your attention.

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