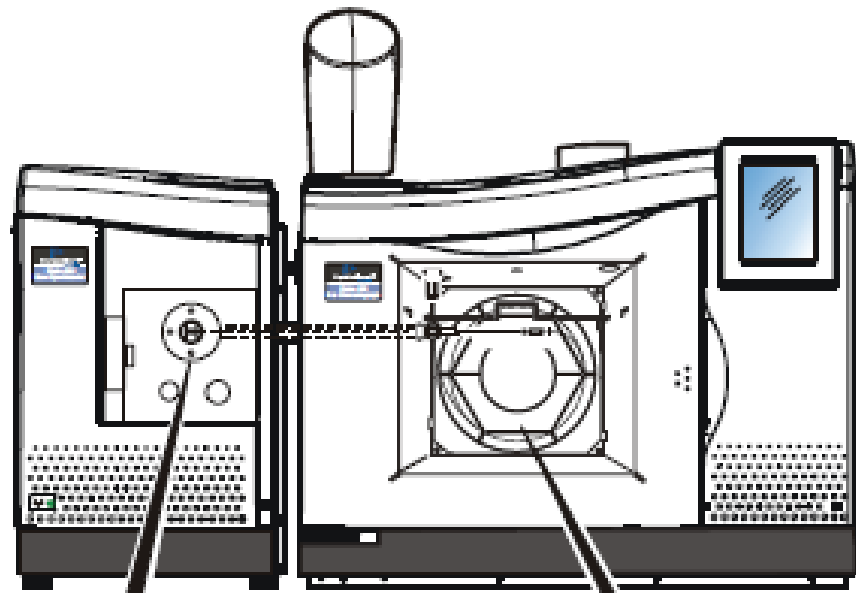


GC-MS interface

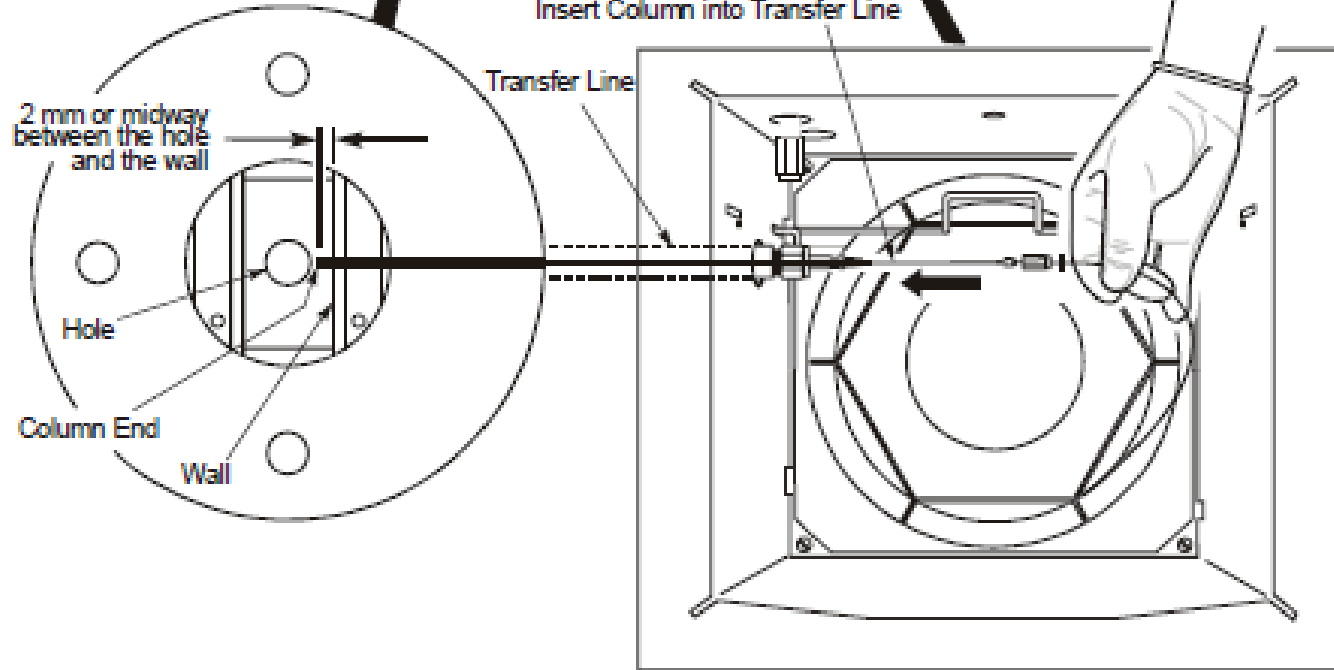
**Krishnadas
26-04-2014**

Interface between GC and MS

- ❖ Interface connects gas chromatograph with a mass spectrometer.
- ❖ After the separation in the GC column, analyte species have to be transported to the mass spectrometer to be ionized, mass filtered and detected.
- ❖ Analytes should not condense in the interface. All interface designs contain a heat source or are lagged with a heating jacket.
- ❖ Analytes must not decompose before entering the mass spectrometer ion source.
- ❖ The gas load (dictated by the mobile phase gas flow rate) entering the ion source must be within the pumping capacity of the mass spectrometer.
- ❖ GC-MS applications where the flow rates to the MS detector do not exceed 2 mL/min can usually be achieved by using direct interfaces.
- ❖ Higher flow rates will require the use of vapor concentrator devices or jet separator interfaces.



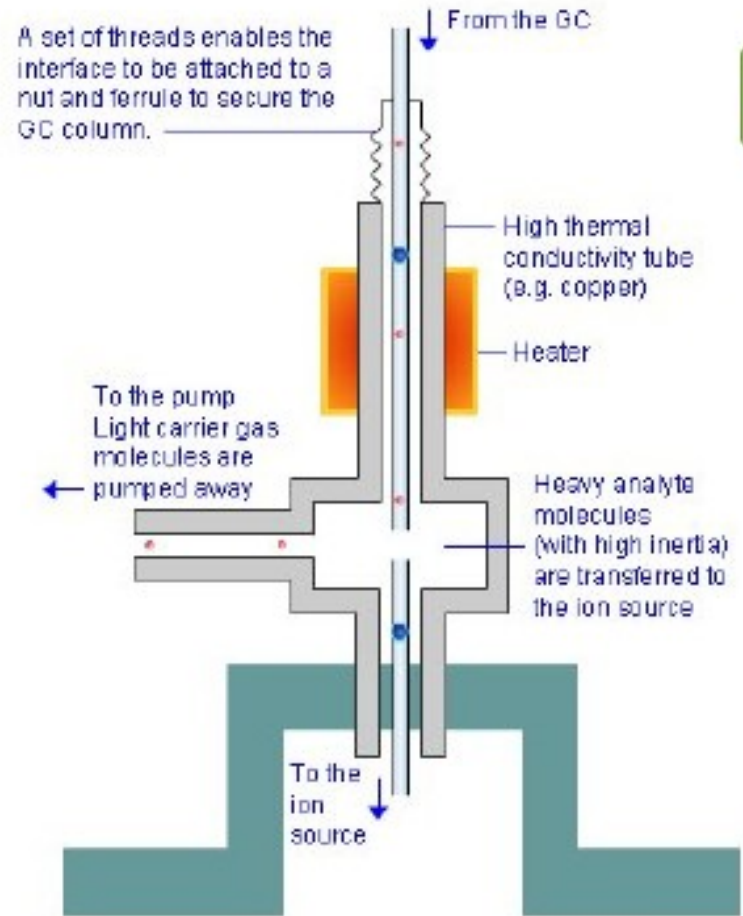
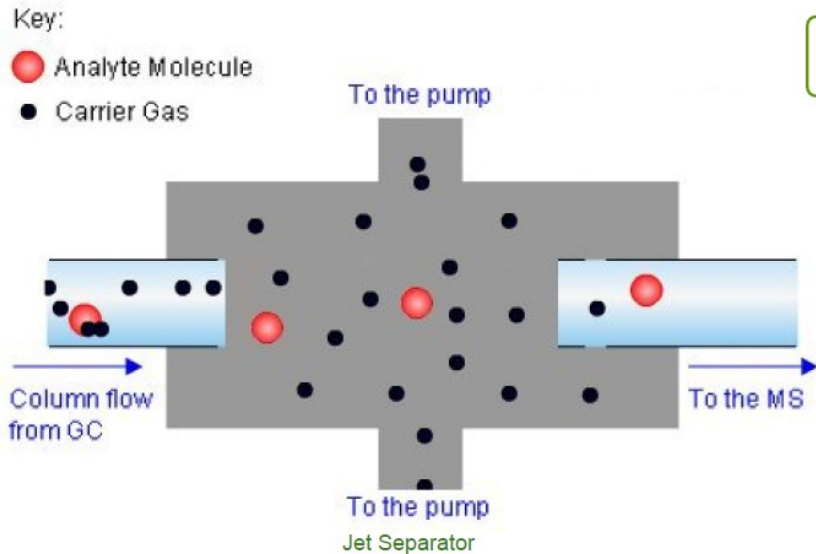
Insert Column into Transfer Line



Jet separator

Not suitable for packed columns with gas flow $> 2\text{ mL/min}$

Some volatile species may be lost to vacuum



Jet Separator Interface.

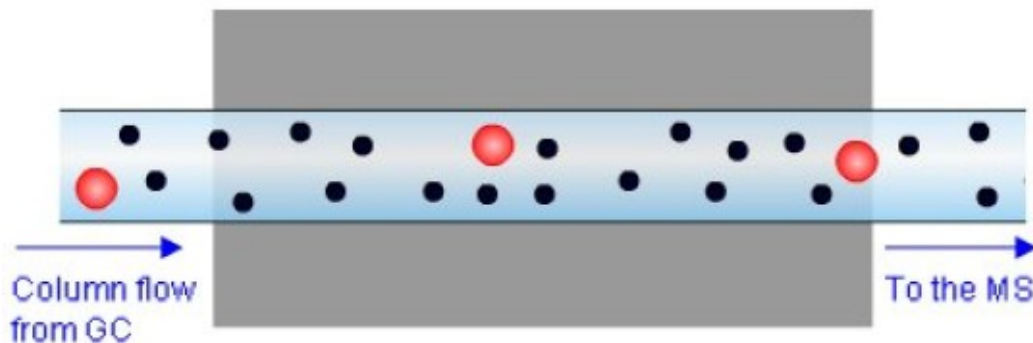
Direct introduction

Most commonly used design for capillary GC
Typical flow rates: 2 mL/min

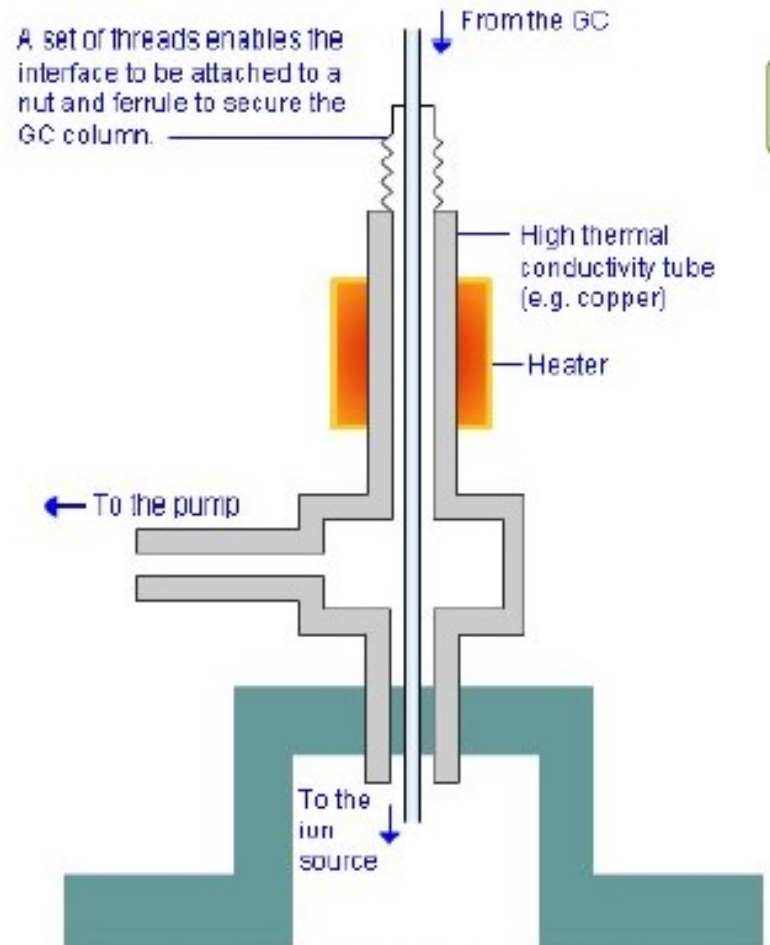
Column is inserted directly into the MS ionisation chamber

Key:

- Analyte Molecule
- Carrier Gas



Direct Introduction



Direct Interface

Interface-column coupling I

Fundamental_GC-MS_Interfaces.pdf (SECURED) - Adobe Acrobat Pro

File Edit View Window Help

Create [Icons] Customize

9 / 14 75% Tools Sign Comment

Interface-Column Coupling I

In GC-MS, the traditional coupling between the GC column and the interface has used a simple nut and a ferrule. It should be noted that Ferrules used for GC-MS differ from those used for capillary GC with other detector types. GC-MS ferrules tend to be 'harder' and therefore less permeable to gas and are usually made from a Graphite / Viton composite material. The disadvantage of these ferrules is that they have a shorter usable life.

This traditional coupling method is no longer recommended, long periods of time are required to properly change the GC column.¹¹

Interface-column coupling

Content Editing

- Edit Text & Images
- Add Text
- Add Image
- Export File to...

More Content

- Add or Edit Link
- Add Bookmark
- Attach a File

Pages

Interactive Objects

Forms

Action Wizard

Text Recognition

Protection

11:05 AM 4/25/2014

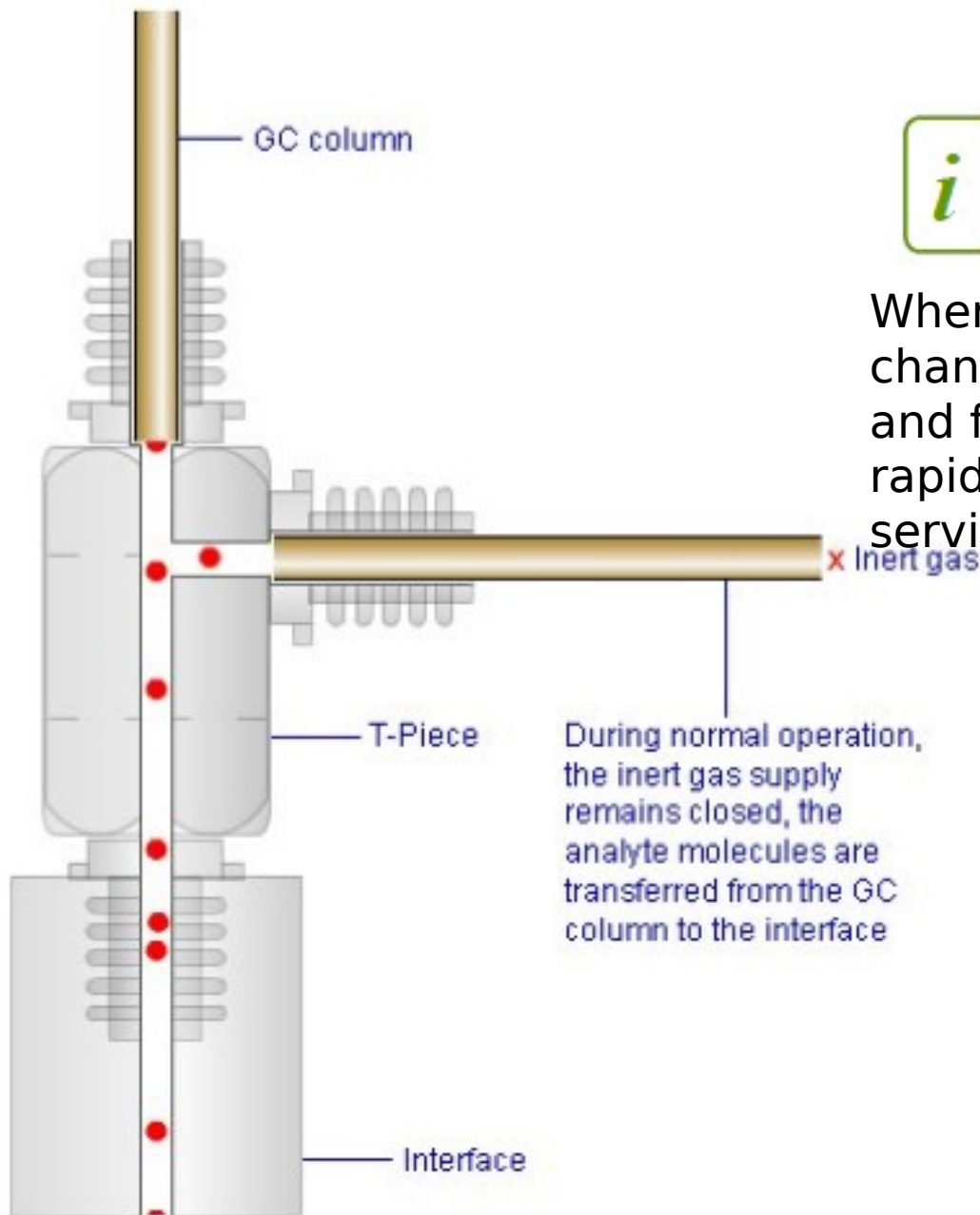
Traditional method

GC-MS ferrules tend to be harder and less permeable to gases

Usually made up of graphite/Vesel

This method is no longer recommended as longer periods of time are required to properly change the GC column

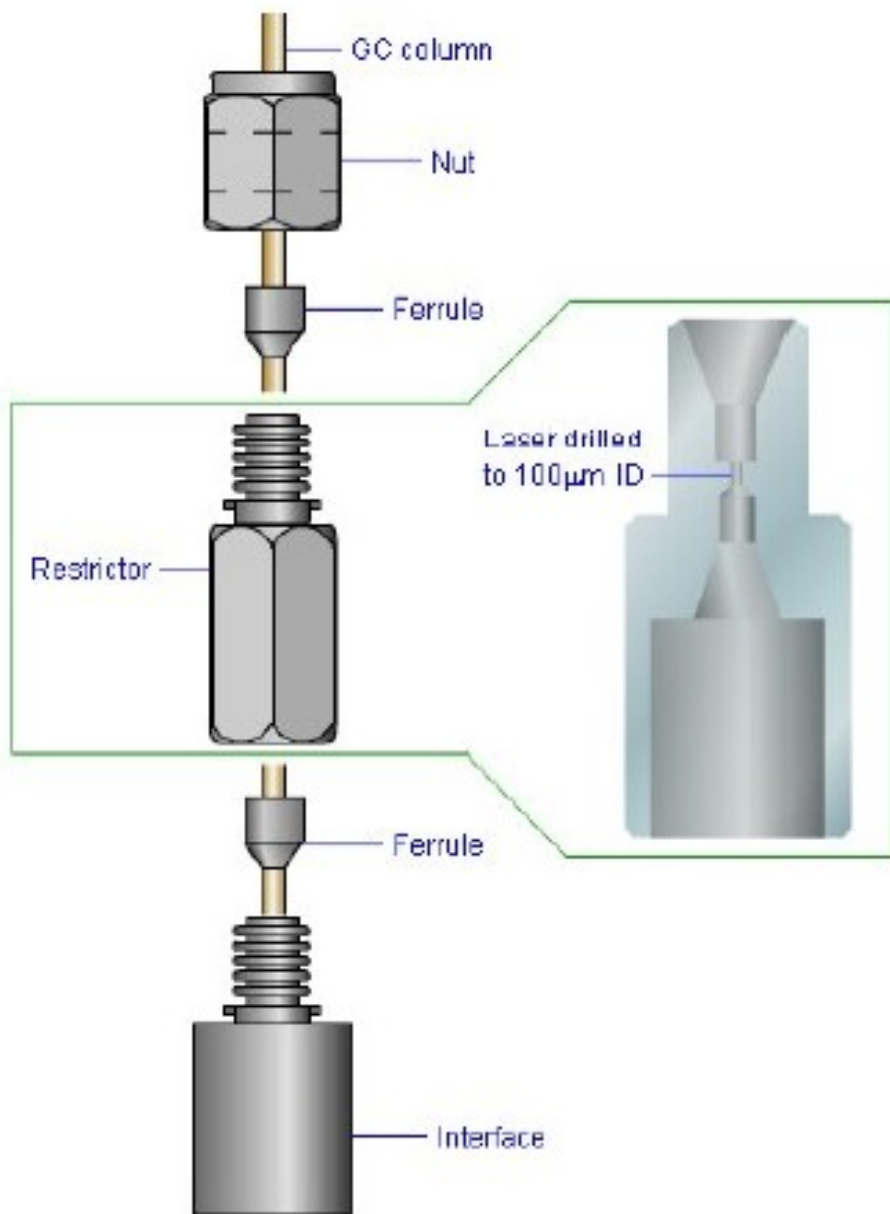
Interface-column coupling II



i

When the column is removed for changing, the inert gas is pressurized and forms an effective barrier to the rapid intake of air and moisture thus serving to retain the vacuum.

Interface-column coupling III-Use of restrictors



When a restriction connector is installed, pressure drop across the 100 µm transfer line makes it necessary to increase the head pressure to obtain retention times equal to those obtained without connector.

THANK YOU