Agilent Technologies

## GC Troubleshooting Series
Part Eight: Loss of Resolution Over Time

Normal wear and tear on your column will affect resolution over time. As you trim the column from reactive samples, it changes the column's efficiency over time. Leverage Method Translation software to help adjust for this. You can download method translation software, and view a demo about how it works, at www.agilent.com/chem/methodtranslator

To begin to solve your loss of resolution issue, break the issue down. Is your separation decreasing? Or are your peaks widening? Each of these indicates different core causes. Here is an example of a decrease in separation over time:

Before   After
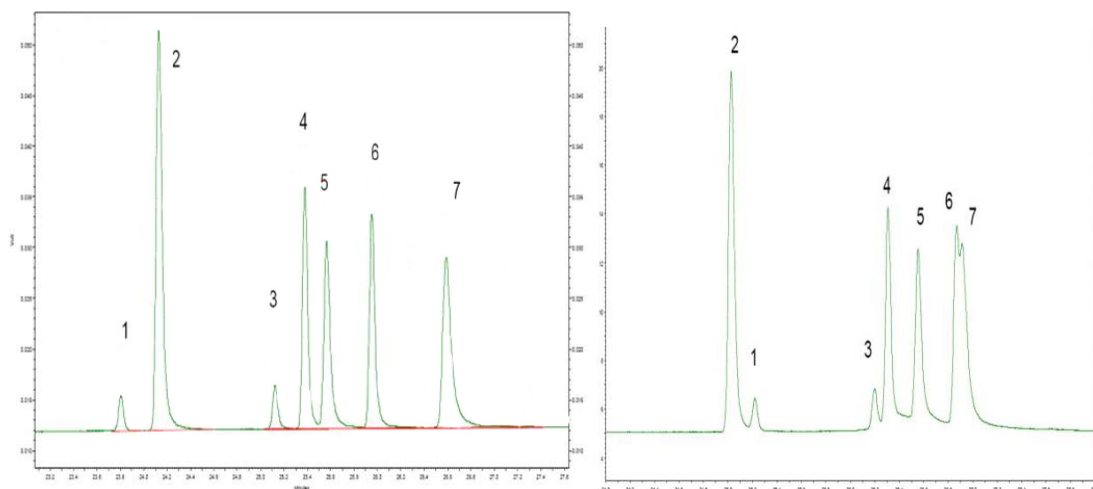
ISSUE: Decrease in Separation Over time
Possible Cause: Changes in temperature, or column dimensions or phase

Check column temperature. Verify column phase and dimensions from the test sheet, and compare to earlier chromatograms.
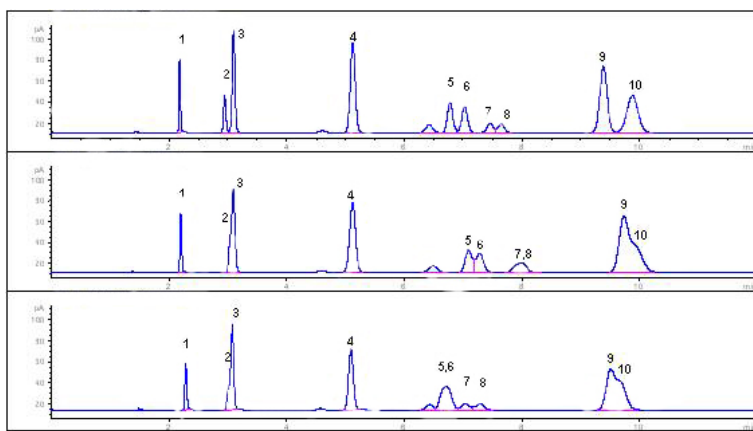
You may also need to trim the column, to remove contamination. If this fixes the problem, you know that was the source.

Possible Cause: Coelution with another peak

Bonus peaks, or ghost peaks, may be appearing as peak widening, due to a close elution or co-elution.

Temperature programming may help fix this.

ISSUE: Increases in Peak Width

Possible Cause: Change in Carrier Gas Velocity

For increases in peak width, start by checking your gas velocity, to ensure it has not changed since your original method. You'll also see a change in retention time if this is your issue.

Possible Cause: Column Contamination

Trim your column to remove contamination.   You may need to trim 6 inches to one foot or more from the end of your column. Be sure to adjust other parameters in our method to accommodate for the new column length. Method Translation software can help you with this. www.agilent.com/chem/methodtranslator

Possible Cause: Change in the Injector

Check injector settings, flow and temperatures.
Re-installi the column into the inlet. Be sure to use the same liner as you always have been.

Possible Cause: Change in Sample Concentration

For wider peak widths, look at sample concentration. Higher concentrations lead to wider peaks.

Possible Cause: Improper Solvent Effect

Solving for improper solvent effect:

- Lower your oven temperature
- Use a better grade of solvent
- Check sample phase polarity match
- Use a retention gap (see more at www.agilent.com/chem/retentiongap)

Wrap-up: Loss of Resolution Over Time

For Loss of separation, look to the following items:
- A difference in column temperature
- Differences in column phase as well as dimensions
- A potential co-elution

For peak widening, look to:
- A change in velocity (which could be related to the shortening column width)
- Column contamination
- Changes in the injector settings
- A change in sample concentration
- Improper solvent effect