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<https://phenomenex.blog/2019/06/20/gas-management-2/>

When it comes to [gas chromatography](#), one of the first questions that arise is “**Why Do I need Pure Gas?**”. To answer this in the most thorough way possible, there are several points that need to be addressed first.

### **Problems Related to Gas Purity**

**When troubleshooting gas chromatography methods, its useful to use the chromatogram as a diagnostic tool and a way to eliminate possible problems in order to identify what's really going on.** However, a lot of time and money is spent on identifying and fixing issues, and the here are numerous problems that are directly related to gas purity. These problems include but aren't limited to:

**Unstable Baseline:** Primarily caused by the detector not being stabilized. Detectors like Flame Ionization Detector (FID), are sensitive to hydrocarbons, while detectors like Electron Capture Detector (ECD) & Mass Selective (MS) Detectors are sensitive to moisture and oxygen content. In fact, oxygen and moisture can eventually kill these detectors resulting in expensive replacement.

**Tailing Peaks:** Peak tailing is commonly related to secondary interaction. The secondary interaction can also be induced in the GC inlet and detectors via depletion or deactivation in the inlet liner and creation of active spots in the column due to excessive bleed. Both depletion or deactivation in the liner and column bleed are primarily caused by oxygen content in carrier gas.

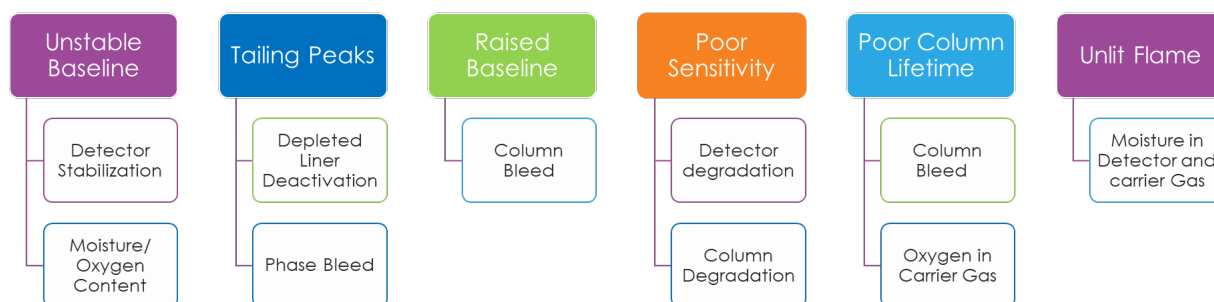
**Raised Baseline:** Raised baseline at the end of a temperature programmed GC is an indication of column bleed. The common cause for depletion or deactivation is oxygen and moisture content in carrier gas.

**Poor Sensitivity:** An unstable detector leads to a noisy baseline and can result in high noise level. This will adversely affect quantitative results and detection limit of an analytical method. Here again, oxygen and moisture content in carrier gas is the primary reason for sensitivity issues.

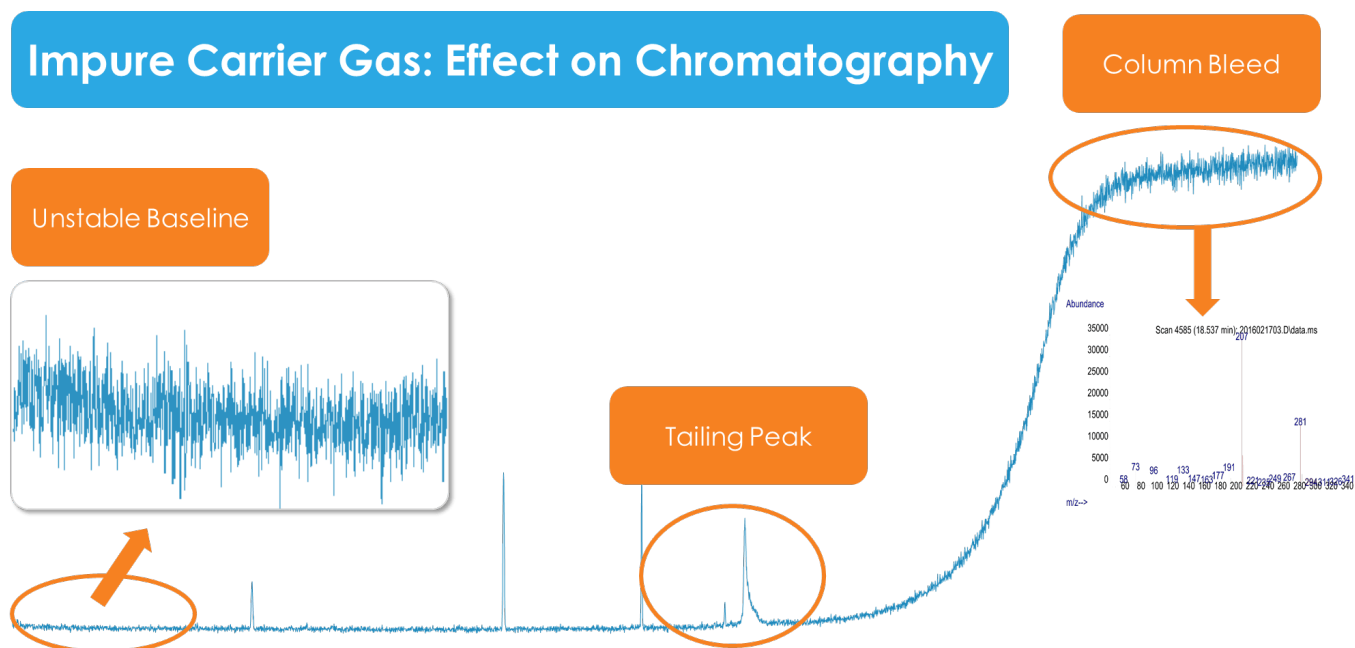
**Poor Column Life:** There are multiple reasons for poor GC column lifetime. Oxygen content in carrier gas can kill the stationary phase right away. Two pp of oxygen at or above 70 °C is enough to cleave and degrade GC stationary phase. Other reasons for poor column life time include a harsh sample matrix and extreme heating and cooling cycles that the column is exposed to.

**Unlit Flame in FID:** Carrier gas or detector gas with high moisture can put off the detector flame in GC FID. An unlit flame in FID will provide no peaks in the chromatogram.

## PROBLEMS Related to Gas Purity



Represented below are the common diagnostic symptoms of impure carrier gas.



## What is the Solution?

The best approach to troubleshooting is to identify the root cause of the problem, fix the problem, and then figure out how to prevent it from happening again in future. Having discussed various carrier gas related issues, it is time to go over prevention techniques to avoid having these problems again. Zebron™ Gas Management Filters serve as a solution to all carrier gas related issues. These are cartridge style filters with high capacity material that provide ultra-pure gas. These cartridge style filters are easy to order and replace as they can be connected in less than 20 seconds. The hardware is made of bulletproof polycarbonate housing and are provided with a sensitive color indicator when the filter is ready to be changed. Aside from providing clean gas, Zebron Gas Management Filters have the following key benefits to end-users:

- Know When to Replace Your Filter- The indicator to each [Zebron™ Gas Management Filter](#) will notify you when it is time to change your filter
- Attach a New Filter in Under 20 Seconds- Avoid system downtime by attaching a new filter to your gas line in seconds! Simply remove the old filter from the connecting unit, replace the o-ring, and click in the new one!
- Never Disrupt Your Gas Line- Once the connecting unit is installed, you will be able to

change filters as often as needed without interrupting the gas line.

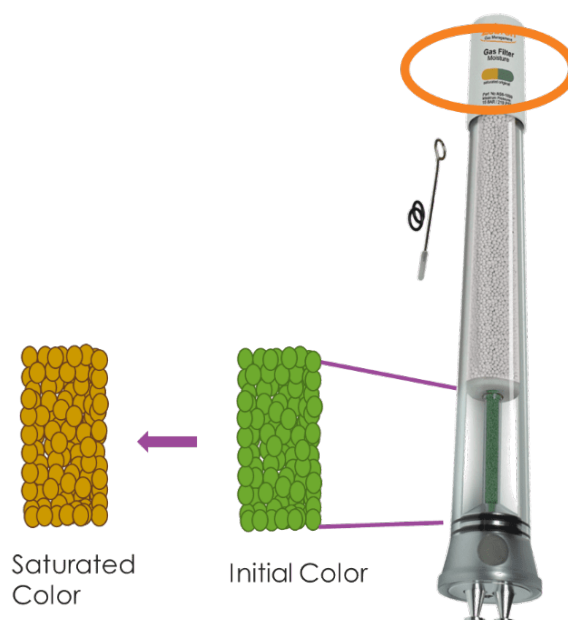
- Customize Your Set Up- Easy to install connecting unit can be fixed to a bench top or wall-mounted to adapt to your laboratory.

## What are My Filter Choices?

There are 4 different filters to choose from, which include: Moisture Filter, Oxygen Filter, Hydrocarbon Filter, and Universal filter.

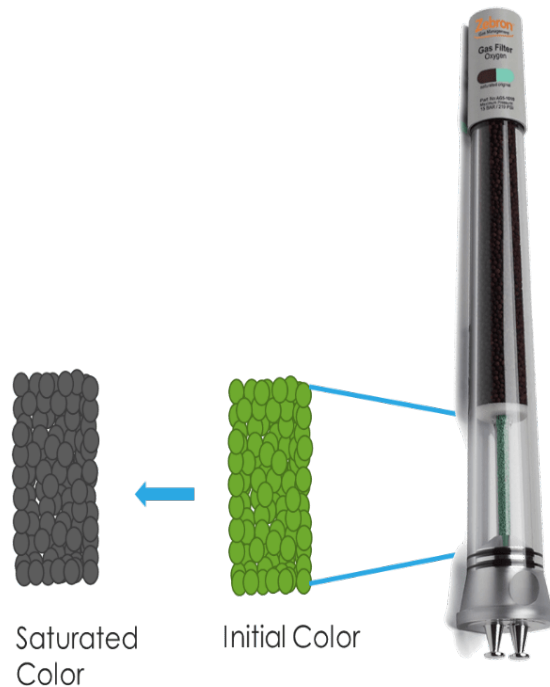
## Moisture Filter

Purpose	• Removes water
Indicator	• Yes
Indicator Color Change	• Green to Pale Brown
Max Capacity	• 7.2g Water
Outlet Concentration	• <0.1 ppm



## Oxygen Filter

Purpose	• Removes Oxygen, Chlorine and Sulfur
Indicator	• Yes
Indicator Color Change	• Green to Gray
Max Capacity	• 150 mL Oxygen
Outlet Concentration	• < 50 ppb



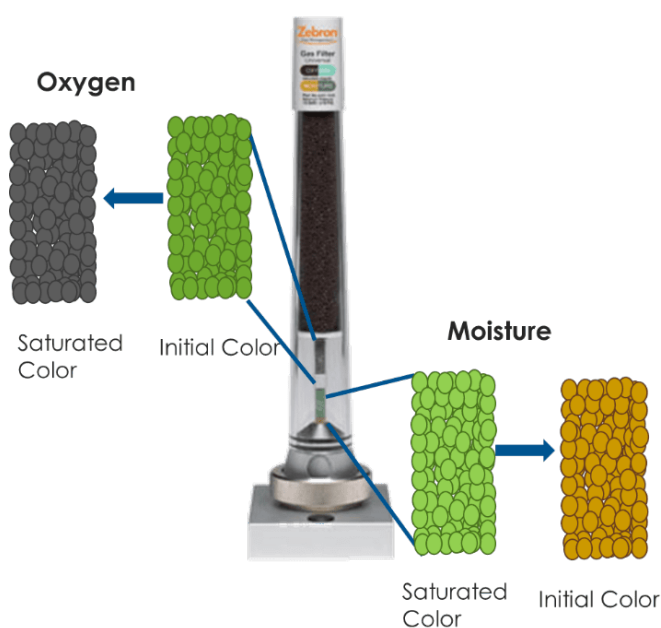
## Hydrocarbon Filter

Purpose	<ul style="list-style-type: none"> <li>Removes Hydrocarbons</li> </ul>
Indicator	<ul style="list-style-type: none"> <li>No</li> </ul>
Max Capacity	<ul style="list-style-type: none"> <li>~ 7 g organic compounds</li> </ul>
Outlet Concentration	<ul style="list-style-type: none"> <li>&lt; 1 ppm</li> </ul>



## Universal Filter

Purpose	<ul style="list-style-type: none"> <li>Moisture, Oxygen, and Hydrocarbon</li> </ul>
Indicator	<ul style="list-style-type: none"> <li>Yes</li> </ul>
Indicator Color Change	<ul style="list-style-type: none"> <li>Green to Pale Brown- Moisture</li> <li>Green to Gray- Oxygen</li> </ul>
Max Capacity	<ul style="list-style-type: none"> <li>1 g Water</li> <li>100 mL Oxygen</li> <li>Hydrocarbons Depending on impurities</li> </ul>
Outlet Concentration	<ul style="list-style-type: none"> <li>Oxygen &lt; 50 ppb</li> <li>Moisture and Hydrocarbons &lt; 1 ppm</li> </ul>



So far, we have answered the “why” and “what” portion of the pure gas question. My next

article will be covering the “how”, “who”, “what else”, and finally a wrap up answer. Make sure to check back in!

[Have questions in the mean time? Chat with our Technical Experts nearly 24/7!](#)

[Click here to learn more about Zebron™ Gas Management Filter](#)

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