HPLC and GC troubleshooting

Short checks only. This is not a repair procedure.

Use the symptom, not an error code from another instrument. Do each check once. Stop for a smell of gas, a hydrogen or leak shutdown, a damaged fitting or column, or a fault that does not change. Call +968 71130316.

HPLC

High pressure

CAUSE Blockage in the guard, column frit, inline filter, or tubing. Buffer salts are a common cause.

CHECK Stop the flow. Bypass the guard. If pressure stays high, remove the column and connect the tubing with a union. Pressure with no column must fall. If it does not, isolate one section at a time back toward the pump. Do not backflush a column unless its instructions allow it. Wash salts out with high-water solvent before a strong organic wash.

STOP Call if pressure stays high after the column is removed.

Low pressure

CAUSE A leak, a loose fitting, a worn pump seal, or a column that is not the method column.

CHECK Confirm flow and solvent composition. Tighten a wet fitting only until the leak stops.

STOP Call if the leak is inside the pump head or tightening does not hold.

No pressure

CAUSE Pump not running, flow at zero, prime valve open, empty bottle, air in the inlet, or a large leak.

CHECK Close the prime valve only after the line is full of solvent. Do not run the pump dry.

STOP Call if it will not prime or the pump stops on a fault. Do not bypass an interlock.

Pressure fluctuation

CAUSE Fast ripple: air or a check valve that is not seating. Slow wander: a small leak, a blocked inlet frit, or poor degassing.

CHECK Purge each channel in use. Confirm the bottle is not empty and the inlet frit is under the liquid.

STOP Call if purging does not settle the pressure.

Baseline noise

CAUSE Noise is fast and jagged. Drift is a slow rise or fall. Usual HPLC causes: aging UV lamp, dirty flow cell, bubbles, or pump pulsation.

CHECK Degas and purge. Note whether noise grew with lamp hours. Do not open a flow cell.

STOP Call if noise remains after degassing, or the detector will not ready.

No peak

CAUSE No injection, detector or lamp off, wrong channel, flow going to waste, or the sample never reaching the column.

CHECK Confirm acquisition, sample in the vial, syringe not blocked, lamp on, and flow reaching the detector.

STOP Call if a standard that used to work still gives no peak.

Peaks smaller than usual

CAUSE Partial injection, degraded standard, wrong wavelength, weak lamp, or column loss.

CHECK Compare with a fresh standard. Change one thing: standard, then lamp, then the injection path.

STOP Call if every peak, including a fresh standard, drops suddenly.

Retention time has changed

CAUSE All peaks move together: flow, temperature, or solvent composition. Peak spacing changes: pH, the wrong column, or a contaminated column.

CHECK Remake the mobile phase and equilibrate at the starting composition.

STOP Call if flow, temperature, and a fresh mobile phase are correct and retention is still wrong.

Peaks move between injections

CAUSE Incomplete equilibration, unstable oven, evaporating premixed solvent, or unstable proportioning.

CHECK Cap the solvent bottles. Use the same equilibration time on every injection. Confirm the oven is at setpoint.

STOP Call if retention wanders while temperature and a fresh mobile phase are stable, especially if pressure wanders with it.

Bubbles in the solvent path

CAUSE Bubbles before the pump: empty bottle, loose inlet, frit above the liquid, or solvent not degassed. Bubbles after the pump: leaking seal or check valve.

CHECK Purge until the stream is continuous. Do not shake solvent bottles.

STOP Call if bubbles return as soon as the line is full.

GC

No peak

CAUSE No real injection, detector not ready, column not connected or broken, oven program too short, or split so high the peak disappears. An FID with no flame gives no peaks.

CHECK Confirm acquisition, syringe, column nuts, and that hydrogen and air are present before lighting an FID. Do not leave hydrogen flowing while you look for a leak. Do not force a column into a fitting.

STOP Call if the flame will not stay lit, or a known standard is still absent.

Peaks smaller than usual

CAUSE Less sample reached the column, or the detector is less sensitive: partial syringe plug, septum or column-nut leak, split too high, or a dirty liner.

CHECK If every peak shrinks, including the solvent peak, check injection volume and detector gases before blaming the column.

STOP Call if the inlet still leaks after the septum and column nut are checked.

Inlet or detector pressure error

CAUSE Inlet: gas off, septum or ferrule leak, column broken or not installed, plugged split vent, or column length and inner diameter in the method that do not match the column. Detector: makeup gas, or FID hydrogen or air, depending on the message.

CHECK Read the message. Do not swap gases to test the fault.

STOP If you smell gas or a leak shutdown trips, ventilate and call. Never use a flame. Hydrogen in an oven is a fire hazard.

Gas generators and cylinders

CAUSE Empty or isolated cylinder, wrong regulator setting, wrong gas on the fitting, or a generator alarm. An exhausted trap usually ruins the baseline. It rarely removes all pressure.

CHECK Confirm cylinder pressure, the live side of the changeover, and the gas identity. Clear a generator alarm before adjusting the GC. Do not force a fitting onto a different gas.

STOP Call the gas supplier or Mahut if a regulator or generator will not reset. Do not open an interlocked generator cover.

Baseline noise

CAUSE A smooth rise at the top of the oven program can be normal column bleed. A sudden noisy baseline is not. Causes: dirty liner, septum particles, poor gas, an exhausted trap, or an unstable FID flame.

CHECK Cool the oven to the start temperature. If the noise collapses, suspect the column or inlet. If it remains with the oven cold, suspect the detector gases. After dirty samples, a new septum and liner is the first consumable step.

STOP Call if the flame will not stay stable, or noise remains after a new liner and septum with the gas supply confirmed.