

Compare Alternative Carrier Gases

Shimadzu is committed to finding alternative gas options and mitigating the effects of the helium shortage and rising costs. Use this table for information about the pros and cons of alternative carrier gases.

	Helium	Hydrogen	Nitrogen
Speed	Good, mid-range analysis speed possible due to its good diffusivity. Achieves best peak resolution with medium linear velocity.	High-speed analysis possible due to superior separation ability. High diffusivity; achieves best peak resolution with higher linear velocity.	Low linear velocity required for optimum separation, leading to longer analysis times.
Separation	Gives good resolution.	Equivalent separation to helium can be achieved, often without method review.	Excellent separation when run at very low speed.
Sensitivity	Suitable for high-sensitivity analysis for all detectors.	Lower sensitivity than Helium but compound and detector dependent. Where possible, comparative analysis is recommended.	Equivalent sensitivity to Helium and Hydrogen for most GC applications. For GCMS, lower sensitivity than Hydrogen and Helium due to increase in noise.
Cost and Availability	Expensive, with rapidly increasing prices. Non-renewable, limited natural resource. Long lead times.	Affordable and renewable. Can use gas generator.	Low-cost and renewable. Readily available, can use gas generator. Large natural supply.
Safety	Inert and non-flammable. Standard safety concerns with pressurised gas cylinder use apply.	Flammable gas. Safety considerations & additional measures recommended. Shimadzu instruments have H ₂ leak detector and built-in safety measures.	Inert and non-flammable. Standard safety concerns with pressurised gas cylinder use apply.
Spectral Impact (GCMS)	No spectral impact due to inertness.	Compound-dependent, possible reduced library match due to protonation. Shimadzu systems employ narrow bore columns to mitigate this effect.	No spectral impact due to inertness.
Columns	GC applications support up to 0.53 mm column I.D. Can be used with packed columns. GCMS applications support up to 0.53 mm column I.D.	GC applications support up to 0.53 mm column I.D. Can be used with packed columns. GCMS applications support column I.D. of 0.25 mm or smaller recommended.	GC applications support up to 0.53 mm column I.D. Can be used with packed columns. GCMS applications support column I.D. of 0.25 mm or smaller recommended.

For further information and to check if your system is compatible with alternative carrier gases, visit: www.shimadzu.co.uk/gas-options