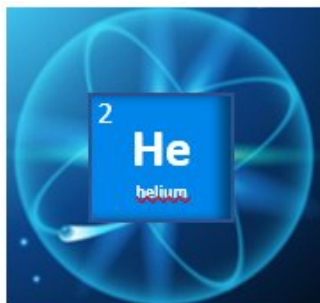


Time to change from Helium to Hydrogen



What happens with Helium?

Even if Helium is the second most abundant element in the Universe, it's relatively rare on earth, trapped underground with natural gas and mined by the natural gas industry. Since decades it has been used for a large spectrum of high tech applications without consideration regarding the fact that it is a non-renewable resource.

The Bureau of Land Management – which controls the National Helium Reserve (NHR) – estimates that 0,45 billion m³, or around 60% of the U.S. national reserves, have been now sold, many scientists are predicting that a possible critical shortage of helium could happen in approximately 25 years!

Of course, as stocks reach lower and lower levels, prices have risen steadily in the last decade. In just 1 year (2012/2013) the price increase has been the same than during the first 2000 decade (Fig.1)

Helium is essential and cannot be substituted in the largest laboratory use, but an available alternative exist for gas chromatography with high purity hydrogen.

But Today GC users can avoid future troubles by switching their carrier gas requirements using hydrogen. Practitioners looking to switch to Hydrogen can get numerous guides and software packages to help the process and expedite the changeover. When done, this change will generate several benefits, covering technical and economic aspects:

- **Costs savings:** Hydrogen is a less expensive carrier gas alternative and users won't have to support any cost increase
- **Supply security:** GC users will no longer experience supply issues as Hydrogen is an abundant and renewable resource,
- **Speed:** Hydrogen has the lowest viscosity at any temperature, so it will produce higher velocities at a given pressure drop (Fig.2)
- **Productivity:** the reduction of noise and analysis time in comparison to Helium and Nitrogen, has a positive impact on the throughput of the laboratory
- **Less spares:** Hydrogen use allows to decrease the temperature for separation, improving the column longevity
- **Availability:** it can be generated with water everywhere.

The final solution, on-site H₂ production

Today the benefits of the Hydrogen use for GC MS applications are supported and expended by on-site generators. As it can be generated everywhere with water electrolysis, the storage and supply of bulky gas cylinders will be a thing of the past. Convenience improvement is a key benefit recognized by users of gas generators. More precisely this means an improvement on ergonomics, safety and productivity.





Higher safety levels with Hydrogen generators

A main argument against Hydrogen concerns safety because it can form an explosive mixture with Air. But for many reasons, a growing number of laboratory analysts are using Hydrogen generators as strong security improvements are generated:

- Minimal storage of Hydrogen: from 2000l of gas at 200 bar cylinders down to only 40ml, low enough that the laboratory air can never build up to explosive levels.
- Automatic shut down: on internal or external (between generator and column) leak detection by accurate pressure monitoring)
- Leaks risk reduction: when changing cylinders removing 50 connections and associated risks of leakages and mistakes!
- Gas on demand: Generator provides only the necessary amount of gas that is supplied directly to the GC
- No transport: tanks are bulky and transporting them to the laboratory may lead to an accident.
- Air control: remote Hydrogen sensors can continuously check if Hydrogen is released to the atmosphere.

Why change with LNI Swissgas?

Since more than 30 years LNI Swissgas develops premium gas generators for laboratories. LNI Swissgas H₂ generators have very unique features when compared to others:

- The smallest footprint on the market: up to less than half the surface occupied by other generators!
- The most efficient: up to 99,99999% high purity H₂ generated at the lowest power consumption. Up to 20 units can be connected in parallel mode.
- The greenest and most convenient: unique energy savings features, remote maintenance features, maintenance-free generators.
- The safest: technologically advanced security features on all generators like an on-board CPU to reveal any internal leaks.



LNI Swissgas range of Hydrogen generator, from rack 19" to the smallest HG ST range.

To switch from Helium to Hydrogen, do not hesitate to contact us!

<https://www.lni-swissgas.eu/en/contacts/>



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