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FREQUENTLY ASKED QUESTIONS (FAQs)

H-Genie® Lite: On-Demand Hydrogen Generator

Does it need deionized water?
What are the power requirements?

The minimum requirement of the water quality is <1 µS/cm conductivity, but it is much better for the cell lifetime to use type 1 Milli-Q level water (55 nS/cm). The power consumption is 700 VA (voltamperes) at maximum capacity.

What type of water needs to be used?
Or what quality of water do you need for such an apparatus?

The only requirement is that the conductivity needs to be below 1 µS/cm (resistivity above 1 megaohm*cm). However, the cell will perform much better and for a longer time if the water is Milli-Q (type 1) quality, with a conductivity of 55 nS/cm.

Can you perform deuteration?

The instrument is designed for regular H_2O. While it is possible to use D_2O, it is usually an expensive application since all water needs to be removed by flushing the system 3-4 times with D_2O. We also do not have performance statistics and cell longevity validation for producing deuterium gas with the instrument.

Can the hydrogen generated be stored?

The main point of the instrument is to avoid the use of cylinders and other gas-storing devices. It is designed as a substitution for hydrogen cylinders; therefore, it is not recommended that the instrument be used as a gas generator for long-term storage. A small amount of gas can still be stored, for example in an autoclave, Parr reactor, or balloon for short-term everyday laboratory use.

Where in the lab should the H-Genie® Lite be used?

The H-Genie® Lite is recommended to be installed within a fume hood. However, if multiple reactor zones need to be filled with hydrogen, it is possible to temporarily put the instrument on a trolley or a cart, for easy transport across the lab.

How much H_2 (liters) is the instrument able to generate per water purifier cartridge?

Assuming maximum capacity usage (8 hours every day), the cell will likely withstand at least 50,000 L of gas production. With good quality water and non-everyday use, this may be increased to 100,000 L which is equal to 1-3 years of usage depending on the number of days of usage per week.

How often do we need to change moisture remover to get dry H_2?

The instrument has a built-in water separator to ensure at least 99.9% hydrogen purity. If the water separator unit malfunctions, there will be an error message and an emergency shutdown, therefore the user does not need to monitor anything unless there is a message about it on the screen.

More answers on back side.

With Helium supply issues, can the H-Genie® Lite be used to generate hydrogen gas for a GC or GCMS?

The purity of hydrogen produced by the instrument is 99.9% which is not recommended for GCMS. If the user installs an extra purifier cartridge into the gas flow line that dries the gas even further, it might be possible to achieve GCMS quality, but this is a custom modification, and the user is fully responsible for making sure the gas quality is sufficient to not damage the GC.

What are the routine maintenance requirements/ preventive maintenance requirements?

- The instrument is recommended to be turned on for 20 minutes every month (even during long-term passive storage) to prevent the cell from running dry.
- If the water conductivity rises above 1 µS/cm, and it permanently stays there (for more than 20 minutes after turning on), we recommend changing the water purifier cartridge.
- It is recommended if the instrument is not used for a couple of days/weeks, that the water tank is drained and replaced with fresh Milli-Q water.
- The user should regularly (once every month) check the cell's operating voltage on the info screen during operation. Under normal conditions, the cell voltage should be between 5500-7500 mV. It will continue to operate at 8000-8500 mV but at this point, preventive maintenance is recommended. Above 9000 mV, the cell is close to the end of its lifetime, and it can produce a failure upon the initialization self-check.

For the classical round bottom flask reaction can we bubble hydrogen directly from the instrument instead of filling up balloons?

Yes, it is possible to connect a plastic tube to the gas outlet of the instrument. The other end of the tube can be equipped with a needle. If a rubber septum is applied to a round bottom flask, the user can pierce it with the needle and submerge it under the reaction solution. Using the "Timer" function of the instrument, the user can set up an experiment time for which they wish to inject hydrogen underneath the solvent inside the flask. After this time expires, the injection of gas will stop automatically.

What is the lifetime of the Cell? Is it based on time or volume produced?

The cell lifetime depends on the frequency of use and the quality of water. Under the worst possible conditions, it will last approximately 6-9 months, but with good quality water and non-everyday use, it may last up to 2-3 years as well.

Can you explain how to use H-Genie® Lite for flow chemistry?

This instrument is not equipped with a mass flow controller (MFC); therefore, accurate injection of gas is not possible (the amount is not adjustable); therefore, it is not recommended for flow reactors.

Is this safe in hoods in the laboratory?

Yes, this is the recommended location for the instrument.

Learn more on our website:

H-Genie® Lite

Hydrogenation catalysts

Watch our on-demand webinar on **"Safe Hydrogenation in the Lab"** for more information.

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MS_PF13165EN 53137 12/2023